B.Sc. DEGREE EXAMINATION,APRIL 2019
III Year VI Semester
Spectroscopy and Laser Physics

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. What is meant by quantization of energy?
2. Write the uses of UV spectrophotometry.
3. What are diatomic molecule and give an example?
4. What are the basic elements of practical spectroscopy?
5. What is Raman Effect?
6. What is the use of Infra red spectroscopy?
7. What is stimulated emission?
8. Mention few medical applications of LASER?
9. Distinguish between photography and holography.
10. What are the characteristics of a hologram?
11. List out the condition for LASER action.
12. What is molecular polarizability?

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Obtain the rotational constant for the rigid diatomic molecules.
14. Derive an expression for rotational constant and discuss the allowed rotational energies in rigid diatomic molecule.
15. Explain the quantum theory of Raman Effect.
16. What is LASER? Explain the spontaneous emission.
17. What are the classification of hologram and write the practical applications of hologram?
18. What are the properties of LASER? Write its application in the field of communications.
19. Explain in detail about the intensity of spectral lines.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Explain the techniques and instrumentation of UV spectrometer and mention two applications.
21. Derive the spectrum of diatomic vibrating rotator.
22. Explain the Raman activity of vibrations with various modes.
23. Derive Einstein relation and hence deduce the expression for the ratio of spontaneous emission rate to the stimulated emission rate.
24. Describe the construction and reconstruction method of hologram.

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