NS5S-1876-A-24

B.Sc. V Semester (NEP) Degree Examination PHYSICS

Elements of Atomic Molecular and Laser Physics Paper: PHY CII-T

Time: 2 Hours

Maximum Marks :60

Instructions to Candidates:

- 1) Answer any Five from section-A.
- 2) Answer any Four from Section-B.
- 3) Answer any Three from Section-C.

SECTION-A

I. Answer any Five of the following.

 $(5 \times 2 = 10)$

- Define ionisation and excitation energy.
- Mention the limitations of sommerfields atomic model.
- State Pauli's exclusion principle.
- What is Bohr Magneton?
- (5.) What is rigid rotator?
- What are stoke's and antistokes lines?
- 7.) Mention any two properties of Laser Light.

SECTION-B

II. Answer any Four of the following.

 $(4 \times 5 = 20)$

- State and explain the Bohr's Postulates.
- Write a note on spectral series of hydrogen atom.
 - 10. Explain stern-Gerlach experiment.
 - 11. Write a note on fluorescence and phosphorescence.
- 12. Mention the applications of Raman effect.
- 13. Write a note on population inversion.

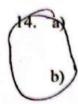
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SECTION-C

III. Answer any Three of the following.



Based on Bohr's postulate, Obtain an expression for the radius of the electron in the n^{th} -orbit. (7+3)

Calculate the radius of the 3-orbit of the hydrogen atom and the energy of the electron in the orbit.

- a) What is normal Zeeman effect. Describe the experimental arrangement of normal Zeeman effect. (7+3)
 - b) Calculate the wave length separation between the unmodified line of wave length 6000°A and the modified lines. When magnetic field of 1 tesla is applied in normal Zeeman effect.



Describe experimental study of Raman effect.

(5+5)

Give the quantum theory of Raman effect.

17. a) What are the requisites of a Laser system.

(5+5)

- b) Describe the construction and working Ruby laser.
- 18. a) Mention the condition required for laser action.

(3+7)

b) Obtain an expression for relation between Einstein's A and B co-efficients.