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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. **(5×2=10)**

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

SECTION-B

II. Answer any Four of the following. **(4×5=20)**

8. State and explain the Bohr's Postulates.
9. 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.

SECTION-C

III. Answer any Three of the following.

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

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

15. 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.

16. a) Describe experimental study of Raman effect. (5+5)

b) 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.
