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SVS-312 B-14
B.Sc. Vth Semester Degree Examination
Physics
(Atomic and Molecular Physics)
Paper - 5.1

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:-

- 1) Answer all the questions from section A
- 2) Answer any five questions from Sec - B and any four from section - C

Section - A

Answer all questions.

(15×1=15)

1. What is the energy equivalent of amu?
2. What are cathod rays.
3. What is the principle of Millikan's oil drop method?
4. What is the value of mass of an electron?
5. Define Impact parameter.
6. State Bahr's quantum condition.
7. What is Bohr Magneton?
8. What is an anomalous zeeman effect?
9. What is Coherent Scattering?
10. What is the allowed energy eigen value of rigid rotator?
11. What is Optical pumping?
12. What is meant by space quantisation?
13. What is coupling scheme?
14. What is the working principle of laser?
15. What is the frequency of Ruby Laser.

Section - B

Answer any five questions.

(5×5=25)

16. Mention and explain in brief postulates of Bohr's theory of hydrogen atom.
17. Discuss how charge of an electron is determined by Millikan's oil drop method.
18. Discuss the degeneracy associated with magnetic quantum numbers.
19. State and explain Pauli's exclusive principle.
20. Write a note on vector atom model.
21. Write any five properties of laser.
22. Write a note on fluorescence and phosphorescence.

Section - C

Answer any four questions

(4×10=40)

23. a) Describe with theory the Dunnington's method of determination e/m of an electron. (7)
b) A charged drop is just floating in uniform electric field of 250×10^2 v/m. Find the charge on it. Given that mass of drop = 9.75×10^{-15} kg. and $g = 9.8$ m/sec². (3)
24. a) Write a note on electron spin. (5)
b) Write a note on structure of spectral lines. (5)
25. Out line the Rutherford's theory of α - particle scattering and obtain an expression for the impact parameter in terms of scattering angle. (10)
26. a) What is Raman effect? Describe the experimental arrangement to study the Raman effect. (7)
b) Write a note on the blue color of the Sky. (3)
27. a) Discuss with Suitable diagram the principle, construction and working of a He-Ne laser. (7)
b) Write a note on application of lasers. (3)
28. Write a note on
a) Phosphorescence. (5)
b) jj -Coupling. (5)