SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc. Physics - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - IV
22UPHCT4007 - Atomic Physics

Total Duration : 2 Hrs. 30 Mins.   Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30 \text{ Marks})$

1. Explain about the L-S and j-j coupling schemes.
2. Discuss the reason for the appearance of fine structure of sodium D lines.
3. Explain about the discovery of stable isotopes.
4. State Mosley's law and explain its importance.
5. Differentiate between ordinary light and laser beam.
6. What are the different pumping methods in laser action?
7. State and derive Bragg's Law.
8. What are the quantum numbers associated with the vector atom model?

Section C

Answer any **THREE** questions $(3 \times 10 = 30 \text{ Marks})$

9. Describe the principle and experimental procedure of Stern and Gerlach experiment.
10. Explain the classical theory for normal Zeeman effect and obtain the expression for Zeeman shift.
11. Describe the principle and working of Bainbridge's mass spectrograph.
12. What is Compton effect? Obtain the expression for change in wavelength and experimental verification.
13. Explain the construction, working and characteristics of Ruby laser.

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