Roll.No. | 22UPHCT4007

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 - NOVEMBER 2025
SEMESTER - IV
**22UPHCT4007 - Atomic Physics**

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

## Section B

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

1. Explain the different quantum numbers associated with the vector atom model.
2. Write a note on the fine structure of sodium D-lines.
3. Discuss Lorentz classical theory of normal Zeeman effect.
4. Describe the limitations of Thomson's parabola method.
5. Define Bragg's law and derive its expression.
6. Differentiate between ordinary light and laser beam.
7. Derive the expression for Einstein's coefficients.
8. State and explain the importance of Mosley's law.

## Section C

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

9. With a neat diagram, discuss the Stern–Gerlach experiment in detail.
10. Explain the experimental arrangement of normal Zeeman effect and derive the expression for Zeeman shift.
11. Explain the theory and working principle of Bainbridge mass spectrograph.
12. Explain the Compton effect and derive the expression for change in wavelength.
13. Explain the construction, working and characteristics of Ruby laser.

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