

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 -2023

SEMESTER - IV

20UPHCT4007 - Atomic Physics

Total Duration : 2 Hrs 30 Mins.

Total Marks : 60

Section B

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

1. Discuss about the L-S and j-j coupling in vector atom model.
2. Explain the interval rule and fine structure of sodium D lines.
3. Discuss Paschen Back effect.
4. Mention Mosley's law and its importance.
5. Discuss the origin and analysis of continuous and characteristic X-ray spectra.
6. Mention Mosley's law and its importance.
7. Difference between ordinary light and Laser.
8. Obtain Einstein's coefficients for spontaneous emission and stimulated emission.

Section C

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

9. (i) With a neat diagram, describe the Stern and Gerlach experiment
(ii) Interpret the results in details.
10. (i) What are normal and anomalous Zeeman effects?
(ii) With neat diagram and related expressions discuss the Lorentz classical theory of normal Zeeman effect.
11. (i) Explain the principle and working of Bainbridge's mass spectrometer.
(ii) Mention its applications.
12. (i) What is Compton effect? What does Compton effect support?
(ii) Obtain the equation for change in wavelength.
13. (i) Explain the construction, working and characteristics of Ruby laser.
(ii) List out the applications of Lasers in medicine.
