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-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. Describe the vector model of the atom.
2. Explain the two different coupling schemes.
3. State the selection intensity and interval rules applicable to optical spectra.
4. Differentiate between ordinary light and laser beam.
5. Describe the construction of Aston's mass spectrograph
6. What are positive rays? Discuss the limitations of Thomson's parabola method of analyzing positive rays.
7. State Moseley's law and its significance.
8. Deduce Einstein's coefficients for spontaneous emission.

Section C

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

9. Describe the Stern and Gerlach experiment and consolidate its physical importance of the results.
10. What is Zeeman Effect? Describe the experimental arrangement for studying the Zeeman effect. Use classical ideas to explain normal Zeeman Effect.
11. Illustrate Bainbridge's mass spectrograph and explain how atomic masses are determined from it. Mention two uses of mass spectrograph.
12. Derive Bragg's law for X-ray diffraction in crystals. Describe and explain the X-ray spectrometer method of determining wavelength of X-rays.
13. Narrate the principle, construction and working of a ruby laser.

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