

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. END SEMESTER EXAMINATIONS APRIL-2022

SEMESTER - IV

20UPHCT4007 - Atomic Physics

Total Duration : 3 Hrs.

Total Marks : 60

**Section A**

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

1. Obtain an expression for the orbital magnetic moment.
2. Write short notes on selection rules and intensity rules.
3. Give the properties of positive rays.
4. State Moseley's law and give its significance.
5. Explain induced absorption, spontaneous emission and stimulated emission.
6. Discuss the coupling schemes of vector atom model.
7. Give the properties of Lasers.
8. Explain the working of a Bainbridge Mass Spectrograph. Give its advantages.

**Section B**

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

9. Elaborate the Vector atom model and explain the different quantum numbers associated with it.
10. Derive an expression for Lande's splitting factor and explain the Anomalous Zeeman effect of Sodium  $D_1$  and  $D_2$  lines.
11. Discuss the working of Aston's Mass Spectrograph with necessary. Give its advantages and limitations.
12. What is Compton effect? Give its theory. How is it experimentally verified?
13. Describe the principle, construction and working of a ruby laser.

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