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 - NOV'2024
SEMESTER - IV
22UPHCT4007 - Atomic Physics

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

Section B

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

1. Explain LS and JJ coupling schemes.
2. Apply the selection rule to explain the fine structure of the sodium D lines.
3. Sketch the Bainbridge mass spectrograph and explain its working.
4. Nacl has its principal planes spaced at 2.820 A. The first order of Bragg reflection is located at 10. Calculate
   (a) the wavelength of the X-rays and
   (b) the angle for the second order Bragg reflection.
5. Discuss the various applications of lasers in communication and medicine.
6. State Mosley's law and mention its importance.
7. Name the various quantum numbers associated with vector atom model.
8. Explain Paschen-Back effect.

Section C

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

9. Describe Stern-Gerlach experiment for the eistence of spatial quantisation.
10. Give an account of Lorentz classical theory of normal Zeeman effect.
11. Explain how Thompson's parabola method is helpful to determine the mass of the positive rays.
12. What is Compton effect. Derive an expression for the change in wavelengh.
13. Distinguish between spontaneous and stimulated emission of radiations. Obtain Einsten's coefficients.

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