

23BPH452

UG PROGRAM (4 YEARS HONORS) WITH SINGLE MAJOR
AT THE END OF FOURTH SEMESTER
PHYSICS-MODERN PHYSICS (Minor)
(w.e.f. Admitted Batch 2023-24)

Time: 3Hours

Maximum: 70 marks

Section - A

5x4=20

Answer any FIVE Questions.

1. State the key postulates of Bohr's model of the hydrogen atom.
2. What are spectral term symbols and explain with examples.
3. Discuss the quantum theory of Raman effect.
4. Write the properties of matter waves.
5. Explain eigen values and eigen functions.
6. Explain the physical interpretation of wave function.
7. Explain Type-II superconductors.
8. Write the applications of superconductors.

Section - B

Answer ALL Questions.

5x10=50

9. (a) Describe the quantum numbers associated with vector atom model.
(Or)
(b) What is the Zeeman effect? Explain the experimental arrangement to study it.
10. (a) What is Raman effect? Explain the experimental setup to study the Raman effect.
(Or)
(b) Describe the theory of vibrating diatomic molecules and derive an expression for vibrational energy.
11. (a) Describe the Davisson-Germer experiment to demonstrate the wave character of electrons.
(Or)
(b) State Heisenberg's uncertainty principle, and illustrate uncertainty principle by diffraction through single slit.
12. (a) Derive Schrodinger time independent wave equation.
(Or)
(b) Explain the postulates of quantum mechanics.
13. (a) What is superconductivity? Give a qualitative description of the BCS theory.
(Or)
(b) Derive London's equation and using it explain penetration depth.