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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: 3 Hours **Maximum: 70 Marks**

Section–A

Answer any Five Questions. **5x4=20**

1. Explain coupling schemes.
2. What are the applications of Raman effect?
3. Write the properties of matter waves.
4. Explain eigen values and eigen functions.
5. Explain high T_c superconductors.
6. Briefly explain the Zeeman effect.
7. Explain the physical interpretation of wave function.
8. Explain the Isotope effect.

Section– B

Answer All Questions. **5x10=50**

9. a) Explain the Stern – Gerlach experiment.

(Or)

b) What is the Zeeman effect? Explain the experimental arrangement to study it.

10. a) What is Raman effect? Explain the quantum theory of 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 uncertainty principle and illustrate the uncertainty principle using Gamma Ray microscope.

12. a) Derive Schrodinger time dependent 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) Explain Type -I and Type -II superconductors.

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