Module 1 Modern Physics

Two Marks Questions

1. State De-Broglie`s hypothesis.
2. What are Matter waves?
3. State Heisenberg`s uncertainty principle.
4. What is a Wave function?
5. What are Eigen Values?
6. What is Physical significance of a wave function?
7. What is Normalization of wave function?
8. Write an equation for De-Broglie wavelength and explain the terms.

Five Marks Questions

1. State De-Broglie hypothesis. Derive an Expression for De-Broglie wavelength of an electron accelerated with potential V volts.
2. What are matter waves? List the characteristic properties of matter waves.
3. Prove the non-existence of an electron inside the atom using Heisenberg`s uncertainty principle.
4. Discuss the conditions to accept the Wave function as an acceptable wavefunction.
5. Derive the eigen values for particle in a box when an electron is in ground state, First and second excited state.

Ten Marks Questions

1. With neat labelled diagram explain the Davisson and Germer`s experiment to prove the dual nature of radiation.
2. a) Prove the non-existence of an electron inside the atom using Heisenberg`s uncertainty principle.
   b) Calculate the de-Broglie wavelength of a 0.3 kg cricket ball with a speed of 120km/hr.
3. Derive an equation for Schrodinger's time independent wave equation in one dimension.
4. Discuss the application of Schrodinger wave equation for particle in one dimensional potential well of infinite height.
5. a) Derive the Normalization of wave function for particle in a box.
   b) Calculate the first 3 permitted energy values in eV for an electron in a box of width 4Å.