

Solid State
Shriram Ramanathan

Exam Practice Questions

1. For a non-degenerate p-n junction, derive the condition under which the Fermi level is spatially invariant.
2. For an electron in a metal subject to electric field \mathbf{E} for time t , derive the energy at end of the pulse. State any assumptions concerning viscosity.
3. Derive the relation between conductivity and Fermi surface area for an electron gas system.
4. For a two sub-lattice model of an antiferromagnet, derive the relation between Curie-Weiss parameter and Neel temperature.
5. Derive a relation between the absorbed optical power density and electron-hole generation rate in a semiconductor crystal. State all variables used.