SS 808 INTRODUCTORY QUANTUM MECHANICS 3-0-0-3

Review of Planck's relation, De-Broglie relation and uncertainty principle. Basic postulates of quantum mechanics - Schrodinger equation: probabilistic interpretation of wave function, one dimension problems - particle in a box, harmonic oscillator, potential barrier and tunneling. Hydrogen atom, multi electron atom and periodic table - electrons in a magnetic field.

Bound states and resonant states - WKB approximation - Born Approximation and it's validity, time dependent perturbation theory.

Scattering theory - Expression for the scattering amplitude - scattering by a square well potential - scattering by a hard sphere.

Bosons and Fermions-Symmetric and antisymmetric wavefunctions - Elements of statistical physics: density of states, Fermi energy, Bose condensation- molecular band theory-Solid state physics: Free electron model of metals, elementary discussion of band theory and applications to semiconductor devices.

TEXT BOOKS/REFERENCES:

1. R. Shankar, *"Principles of Quantum Mechanics"*, Second Edition, Springer, 2007
2. L I Schiff, *"Quantum Mechanics*", Mc Graw Hill, Inc 2002
3. J J Sakurai, "*Modern Quantum Mechanics*", Addison Wesley, 1994
4. Kurt Gottfried, "*Quantum Mechanics*", Volume 1, W A Benjamin Toe, 1966 5. Arthur Beiser, "*Concepts of Modern Physics*", Sixth Edition, Tata McGraw Hill, 2002.