QUANTUM MECHANICS

Physical background

Photoelectric effect. Electrons in atoms and line spectra. Particle diffusion.

Schrödinger equation and solution

De Broglie waves, Schrödinger equations. Superposition principle. Probability interpretation, density and current. Stationary States. Free particle, Gaussian wave packet. Motion in 1-dimensional particle, parity. Potential step, Square well and barrier. Harmonic oscillator.

Observables and expectation values

Position and momentum operators and expectation values. Canonical commutation relations. Uncertainty principle

Observables and Hermitian operators. Eigenvalues and eigenfunctions. Formula for expectation value.

Hydrogen atom

Spherically symmetric wave ~~equation~~ function for spherical well and hydrogen function.

Orbital angular momentum operators. General Solution to hydrogen atom.

Appropriate books

Feymann, Leighton and Sands Vol 3 chpt 1-3 of Feymanman Lectures on physics. Addison-Wesley 1970

† P.V Landschoff A.J.F Metherell and W.G Rees Essential Quantum Physics. CUP 1997

S Gasiorowicz Quantum Physics Wiley 2003

†AIM Rae Quantum Mechanics. IOP Science Publishing 2002

L.I Schiff Quantum Mechanics McGraw Hill 1968