

ENGINEERING PHYSICS

UNITS:-

- 1. Quantum mechanics**
- 2. Solid State Physics**
- 3. Semiconductor Physics**
- 4. Laser Physics**

1. Quantum mechanics:-

1. Matter Waves
2. Properties of matter waves
3. Wave function and its physical significance
4. Schrodinger time dependent and independent wave equation
5. Operators
6. Eigenvalues and function
7. Expectation values
8. Application of Schrodinger equations:-
 - 1) Motion of free particle
 - 2) Electron in an infinite deep potential well(rigid box)
 - 3) Electron in finite potential well(non - rigid box)

2.Solid State Physics

- 1.Lattice parameters
- 2.Miller indices
- 3.Interplanar distances
- 4.Density of crystals(linear, planar, volume)
- 5.Sommerfeld free electron theory
- 6.Density of states(3D)
- 7.Fermi-Divac probability distribution function
- 8.Nearly free electron theory(E-K curve)
- 9.Classification of solids on basis of band theory

3.Semiconductor Physics

- 1.Electron and hole concentration in semiconductors
- 2.Intrinsic semiconductor
- 3.Intrinsic and extrinsic semiconductor
- 4.Fermi level in intrinsic and extrinsic semiconductor
- 5.Law of mass fraction
- 6.Temperature variation of carrier concentration in extrinsic semiconductor
- 7.Electrical conductivity in extrinsic semiconductor
- 8.Hall effect

4.Laser Physics

- 1.Introduction to lasers
- 2.Spontaneous and stimulated emission of radiation
- 3.Thermal equilibrium condition
- 4.Condition for light amplification
- 5.Population inversion
- 6.Pumping (3&4 level)
- 7.Optical resonator
- 8.Laser beam characteristics
- 9.Ruby laser
- 10.Nd-YAG laser
- 11.He-Ne laser
- 12.Semiconductor laser
- 13.Engineering application of laser