

National Engineering College, K.R.Nagar, Kovilpatti- 628 503

(An Autonomous Institution Affiliated to Anna University)

Department of Science and Humanities

SYLLABUS FOR FACULTY RECRUITMENT

PHYSICS

Electromagnetic Theory

Vector Calculus-Gradient, Curl, Divergence-Gauss divergence theorem, Stokes theorem-Cartesian, Cylindrical and Spherical coordinate systems- vector identities. Electrostatics - Gauss's law, Coulomb's law-Electric field due to infinite line charge, circular ring and circular disc-Dielectrics- Polarization mechanisms-boundary conditions-Magnetostatics-Magnetic materials- dia, para, ferro, ferri and antiferromagnetic materials-Hysteresis- Faraday's laws of electromagnetic induction- Electromagnetic waves- properties and application

SOLID STATE PHYSICS

Crystalline and amorphous solids, Symmetry operations - Point groups and space groups.- Diffraction of X-rays-Bragg's Law – Experimental methods in X-ray diffraction, Free electron theory-Band theory of solids-Carrier concentration in intrinsic and extrinsic semiconductors-Hall effect, Superconductors-Properties and Applications - BCS theory

MECHANICS AND PROPERTIES OF MATTER

Moment of inertia: Rotation of rigid body, Moment of inertia, Torque, Angular momentum, Kinetic energy of rotation. Theorem of perpendicular and parallel axes, Moment of inertia of solid sphere, hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross section,

Elasticity: Elasticity, Stress and Strain, Hook's law, Elastic constant and their relations, Poisson's ratio, Torsion of cylinder and twisting couple, Bending of beam - Cantilever and Centrally loader beam.

OPTICS

Optical properties - Reflection, Refraction, Dispersion, Interference, Diffraction and Polarization of Light – Optical instruments – Wave theory of light - LASER - Fibre Optics.

ELECTRONICS

Basic Electronics: PN junction diode- Zener diode – LED- Half wave and Full wave rectifiers- Transistors - Transistor configurations – Field Effect Transistor – JFET – MOSFET - Unijunction Transistor

Digital Electronics: Logic gates - AND, OR, NOT, Ex-OR, NAND, NOR - Number system - Decimal to binary and binary to decimal conversion - Flip flops - RS flip flop - JK flipflop - Binary counters - Half adder and Full adder - Oscillators and Multivibrators - Basic definitions