Unit I

Syllabus : Review of 3D Coordinate Geometry, Vector Calculus, Physical significance of Gradient, Divergence, Curl, Electric field intensity (E), Displacement Flux Density (D), Gauss's law, Electric potential (V), Potential Gradient, E/D/V due to uniform sources (point charge, infinite line charge, infinite surface charge), Maxwell Equations for Electrostatics, Current, Current Density, physical interpretation.

Unit II

Syllabus : Lorentz force, magnetic field intensity (H), Magnetic Flux Density(B), Biot–Savart's Law – Ampere's Circuit Law – H due to straight conductors, circular loop, infinite sheet of current, Maxwell Equations for Magneto- Statics, physical interpretation.

Unit III

Syllabus : Electric Dipole, Dielectric Polarization, Properties of Conductors, Dielectric Materials, Boundary conditions (dielectric-dielectric, conductor – dielectric), Significance and applications of Poisson's and Laplace's equations - Capacitance, Energy density.

Magnetization, Magnetic materials, Boundary conditions for Magnetic Fields, Magnetic force, Torque.

Unit IV

Syllabus : Scalar and Vector Magnetic Potential, Poisson's and Laplace Equations, Faraday's law, Translational and motional emf, Displacement current density, Continuity Equation, Time varying Maxwell's equations - point form, integral form, Power and Poynting theorem, Concept of Retarded magnetic vector potential.

Unit V

Syllabus : Maxwell's equation using phasor notations, Electromagnetic wave equations (Helmholtz equation), Relation between E and H, depth of penetration, concept of polarization, Reflection by perfect conductor-normal incidence, reflection by perfect dielectric- normal incidence, snell's law.

Unit VI

Syllabus : Line parameters, skin effect, general solution, physical significance of the equations, wavelength, velocity of propagation, the distortion less line, Reflection on a line not terminated in Z_0, reflection coefficient, open and short circuited lines, reflection factor and reflection loss, standing waves; nodes; standing wave ratio, Input impedance of dissipation less line, Smith chart and its applications in solving the transmission line parameters.

Chapter 8 : Transmission Line Theory 8-1 to 8-48

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