

SYLLABUS

PANJAB UNIVERSITY B.Sc. Part-I Semester-II

Vibrations, Waves and E.M. Theory-II

Paper B : VIBRATIONS, WAVES & E.M. THEORY-II

(30Hrs.)

UNIT - I

Waves in physical media, Wave equation and its solution, Types of waves, particle velocity, acceleration and energy in progressive waves. Longitudinal waves on a rod.

Transverse waves on a string, characteristic impedance of a string, Waves in absorbing media.

Reflection and Transmission of transverse waves on a string at discontinuity, Reflection and transmission of energy.

Reflection and transmission of longitudinal waves at a boundary.

Standing wave ratio, Impedance matching, Energy of vibrating string. Wave and group velocity.

UNIT - II

Physical interpretation of Maxwell's equations, E.M. waves and wave equation in a medium having finite permeability, permittivity and conductivity. Energy flow due to EM wave - Poynting vector, Impedance of a dielectric to EM waves. EM waves in a conducting medium and skin depth. Impedance and Refractive index of a dielectric and a conductor.

Reflection and transmission of EM waves at a boundary of two dielectric media for normal and oblique incidence.

Reflection of EM waves from the surface of a conductor at normal incidence.