

Syllabus

Paper B : Electronics and Solid State Devices - I

(30 Hrs.)

Unit- I

Concepts of current and voltage sources, Thevenin's theorem, Norton's theorem, Source conversion, CRO, Block diagram, construction and principle of working, Use of CRO for frequency, time period, special features of dual trace, phase measurements.

Energy band diagrams in semiconductors, Direct and indirect semiconductors, Formula to calculate Position of Fermi level in p and n semiconductors, Barrier formation, energy band diagram of $p-n$ junction, Formula for Depletion width, Qualitative ideas of current flow mechanism in forward and reverse biased diode, V-I characteristics, static and dynamic resistance, Depletion and diffusion capacitance, zener diode, LED, photodiode and solar cell.

Unit- II

Diode circuits, Clipping circuits, Rectification : half wave, full wave and bridge rectifiers, filter circuits (C , LC and π filters), rectification efficiency and ripple factor in LC filter, voltage regulation circuit using zener diode, voltage multiplier circuits. Bipolar junction transistors : Structure and working, different currents in transistor, switching action. Characteristics of CB , CE and CC configurations, Active, cutoff and saturation regions.

Load line analysis of transistors, Q-point, Transistor biasing and stabilization of operating point, fixed bias collector to base bias, bias circuit with emitter resistor, voltage divider biasing circuit. Working and analysis of CE amplifier using h -parameters, current, voltage and power gain, input and output impedance, Class A, B and C amplifiers.