

Unit I

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, ohm's law, Kirchhoff's current and voltage laws, analysis of simple circuits with dc excitation, Mesh loop analysis, Nodal Analysis, Thevenin, Norton and Superposition Theorems.

Unit II

Diode theory and applications Basic idea about forward bias, reverse bias and VI characteristics, ideal diode, second, surface mount diodes, Zener diode, Testing of diode with multi-meter, half wave rectifier, full wave rectifier, bridge rectifier, Design of un-regulated DC power supply, Clipping circuit, Clamping circuit, Reading datasheet of semiconductor diode.

Unit III

Bipolar junction transistors, construction and working, BJT Common Emitter, Common Base and Common Collector characteristics, BJT Amplifier, Testing of bipolar junction transistor with multi-meter, Reading datasheet of BJT

Unit IV

The Amplifier Block, Introduction to Operational Amplifier ,Op-amp Parameters: input offset voltage, and current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, supply voltage rejection ratio, slew rate, gain, Ideal Operational Amplifier, Practical Properties of Operational Amplifiers, Inverting and Non-Inverting Amplifier , Summing , scaling, differential ,Integrator ,Differentiator, instrumentation Operational Amplifiers.

Reference Book:

- 1). Electronics Device and Circuit Theory by Robert Boylestad and Louis Nashelsky.
- 2). Elements of Electrical Engineering by U.A. Patel.
- 3). Electronics devices and Circuits by Jacob Millman, Christos C. Halkias, Satyabrata Jit.
- 4). Electronics devices and Circuits by J.B. Gupta.

Practical(s)

- 1 To study and verify ohm's Law.
- 2 To study and verify Kirchhoff's voltage law and Current law.
- 3 To study and verify Superposition theorem.
- 4 To study and verify Thevenin's theorem.
- 5 To study and verify Norton's theorem.
- 6 To study V-I characteristics of semi-conductor Diode.
- 7 To study Half-wave Rectifier circuit.
- 8 To study Full-wave Rectifier circuit.
- 9 To study Zener Diode Circuit.
- 10 To study common Base characteristics of BJT.
- 11 To study common Emitter characteristics of BJT.
- 12 To study common Collector characteristics of BJT.
- 13 To study input offset voltage of Op-Amp.

- 14 To study Op-Amp as Inverting and Non-Inverting Amplifier.
- 15 To study Op-Amp as Integrator.
- 16 To study Op-Amp as Differentiator.