ELECTRONIC DEVICES AND APPLICATIONS

Paper Code	**CEN-304**
Course Credits	**4**
Lectures / week	**3**
Tutorial / week	**1**
Course Description	**UNIT – I**

Review of p-n junction diode. Characteristics and applications of special types of diodes (schottky barrier diodes, tunnel diodes, varactor diodes, LED, and photodiodes. Rectifiers, Filters and Regulators: Half wave rectifier, ripple factor, full wave rectifier, Capacitor filter. Zener Diode: Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators. Clipper and Clamper Circuits, Special devices: SCR, DIAC, TRIAC characteristics and their applications.

UNIT- II

Transistor construction, Detailed study of currents in a transistor, alpha and beta, Input and Output characteristics of transistor of transistor configurations; BJT Biasing: Fixed bias, Emitter bias, Voltage Divider bias, Collector Feedback, Stabilization Factors, (S, S', S''); Junction Field Effect Transistor: Construction, Transfer Characteristics, MOSFET characteristics (Enhancement and Depletion mode), and Comparison of Transistors, CMOS. JFET Biasing, MOSFET biasing.

UNIT- III

Small Signal low frequency BJT amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, input impedance and output impedance. Comparison of transistor configurations in terms of Ai, Ri, Av, Ro. BJT Small Signal analysis of different configurations. FET Small Signal Model, analysis of

different configurations; Frequency Response Of Transistors: BJT and FET high and low frequency response.

UNIT- IV

Concept of Feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on input and output characteristics, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis. Oscillators: Condition for oscillations. RC-phase shift oscillators with Transistor and FET, Hartley and Colpitts Oscillators, Wein Bridge oscillator, Crystal oscillators.

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UNIT – V

Emitter Coupled Differential Amplifier pair, ADM, ACM and CMRR. Opamp characteristics, Structure of Opamp parameters. Non Linear applications of Opamp: Comparator, Schimidtt Trigger, Precision Rectifier, Logarithmic and Exponontial amplifiers.

Reference / Text Books:

- Boylested and Nashelsky, "Electronic Devices and Circuit Theory", Prentice Hall of India, 1992.
- Adel S. Sedra, Kenneth Carless Smith, "Microelectronic Circuits", Oxford University Press, 1998.
- Jacob Millman, Christos Halkias, Chetan Parikh, "Integrated Electronics", McGraw Hill India, 2009.

Computer Usage / Software Requires: