

ECL-101-A	ELECTRONIC COMPONENTS AND DEVICES	L	T	P	Cr
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Objective: The objective of the course is to provide fundamental knowledge of electronic components, devices and circuits. It covers basic principle of operations and usefulness of some of the electronic components that help us in designing of electronic circuits

THEORY:

Note: Question No 1 is compulsory and will be of short answer type from entire syllabus. Two questions are to be attempted out of three questions from each Section A & B.

SECTION – A

UNIT 1: Semiconductor

Intrinsic and extrinsic, p-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, depletion layer, potential barrier, electric field, forward and reverse biased junction, Diodes, V-I characteristics of diode.

UNIT 2: Diode Applications

P-N junction diode as rectifier, clipper and clamper, Clipping at two independent levels, Comparators, Sampling Gate, Rectifiers, Capacitor filter, Zener diode as voltage regulator.

UNIT 3: Some Special Devices

Photodiodes, photo detectors, solar cell, light emitting diodes. Introduction to Tunnel Diode, IMPATT diode, The GUNN diode, SCR, DIAC, TRIAC.

SECTION – B

UNIT 4: Bipolar Junction Transistor

Construction, basic operation. CB, CE and CC-configuration, input and output characteristics, region of operation, active, cutoff and saturation region. Photo transistor, Uni-Junction Transistor (UJT) : Principle of operation, characteristics.

UNIT 5: FET Construction

Construction, n channel and p channel, characteristics, parameters, Enhancement and depletion MOSFET and its Characteristics, analysis of FET in various configuration.

UNIT 6: Operational Amplifier

Introduction Op-Amp, Block diagram & Pin Diagram of Op-Amp, Ideal characteristic Op-Amp (CMRR, Slew rate, Virtual ground) Applications of Op-Amp: Inverting amplifier, Non inverting amplifier, Differential Amplifier, Summing amplifier, Integrator – Differentiator – Op-Amp Specifications.

Text Books:

1. Millman and Halkias, “Electronics Devices and Circuits” 2nd Ed., Tata McGraw-Hill, New Delhi, 2008.
2. NN Bhargave, “Basic Electronics & Linear Circuits” Tata McGraw Hill, 2007.

Reference Books:

1. Sedra A S and Smith K C, “Microelectronic Circuits” 4th Ed., New York, Oxford University Press, New York, 1997.
2. David A. Bell, “Electronic Devices and Circuits”, Oxford University Press, 5th edition
3. Boylestad and Nashelsky, “Electronic Devices and Circuit Theory”, 8th Ed, Pearson Education India, New Delhi, 2002.
4. Millman and Grabel, “Microelectronics”, 2nd Ed. Tata McGraw-Hill ,1999.