VAAGDEVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

ELECTRONIC DEVICES AND CIRCUITS

B.Tech. I Year II Sem.

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Course Objectives:

- To familiarize the student with the principle of operation of Junction diode, BJT and FET.
- To know the applications of devices.
- To know the switching characteristics of devices.
- To Understand the characteristics and operation of various special purpose devices.

UNIT - I

Diodes: Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics, Diode as a switch- switching times.

UNIT - II

Diode Applications: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters, Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.

UNIT - III

Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times

UNIT - IV

Junction Field Effect Transistor (FET): Construction, Principle of Operation, Pinch-Off Voltage, Volt- Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.

UNIT – V

Special Purpose Devices: Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principleof Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.

Course Outcomes: Upon completion of the Course, the students will be able to:

CO-1: Acquire the knowledge of PN diode and its characteristics.

CO-2: Design the rectifiers with and without filters for specified DC voltage.

CO-3: Illustrate the voltage- current characteristics of Junction Transistor and different configurations of transistor

CO-4: Acquire knowledge about the construction, theory and characteristics of FET and MOSFET

CO-5: Acquire the knowledge about the role of special purpose devices and their applications.

TEXT BOOKS:

1. Jacob Millman - Electronic Devices and Circuits, McGraw Hill Education
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.

REFERENCE BOOKS:

1. Horowitz -Electronic Devices and Circuits, David A. Bell – 5th Edition, Oxford.
2. Chinmoy Saha, Arindam Halder, Debaati Ganguly - Basic Electronics-Principles and Applications, Cambridge, 2018.
3. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.