PC 201 EC **With effect from academic year 2015-16**

ELECTRONIC DEVICES

Instruction : 3Hrs/week
SEE : 70Marks
CIE :30Marks
Credits : 3

Objectives :

- To understand the characteristics and applications of Diode.
- To understand the characteristics, configurations and biasing of transistors.
- To understand the characteristics and biasing of FET.
- To study the working of CRO.
- To study the working of Thyristors and their characteristics.

Unit 1 Formation of PN diode: Types of materials, electrons and holes in an Intrinsic Semiconductor, Conductivity of a semiconductor, Carrier concentrations in an Intrinsic Semiconductor, Fermi level in an Intrinsic semiconductor, Donor and Acceptor impurities, Fermi level in a semiconductor having impurities, Diffusion.
PN junction as a diode: band structure of an open circuited PN junction, Current components in a pn diode, Volt-ampere characteristics, Temperature dependence of pn characteristics, diode resistance, Transition capacitance, Diffusion capacitance, PN diode forward bias and reverse bias condition.

Unit 2 Rectifiers: Half-wave, Full-wave and bridge rectifiers and their performance characteristics. Design of rectifiers with filters (L, C, LC and π). Comparison of different rectifiers with and without filters.

Unit 3 Bipolar Junction Transistors: Junction transistor, Transistor current components, Current flow in BJT. CB, CE, CC configurations, Input and Output characteristics.
Biasing of BJT: Operating point, Bias stability, Stability factor S, Types of Biasing circuits for BJT, Fixed bias, Collector-to-base bias and Self-

bias methods. Bias Compensation techniques, Thermal Runaway, Thermal Resistance, Thermal Stability, Heat sink.

Unit 4 Field Effect Transistors: JFET formation, FET operation, Pinch-off Voltage, V-I characteristics. Comparison of BJT and FET. MOSFET, Enhancement MOSFET and Depletion MOSFET and characteristics.

Unit 5 Special Devices: Zener diode, Tunnel diode, Varactor diode, Schottky diode, Photo diode and their Input- Output characteristics. SCR, Diac, Triac, UJT, CRO - Block diagram and its applications in Electronic measurements.

Suggested Reading :

1. Milliman, J. Halkais.C.C and Satyabrata Jit, " Electronic Devices and Circuits", 3rd edition, Tata Mcgraw-Hill, 2011.
2. J.B.Gupta, " Electronic Devices and circuits", Katson educational series, 4th edition , 2011.
3. Salivahan. S, Suresh Kumar.N " Electronic Devices and circuits", 3rd edition, Tata McGraw-Hill, 2012.

PC 251 EC **With effect from academic year 2015-16**

ELECTRONIC DEVICES LAB

Instruction : 2 Hrs/week
SEE : 50 Marks
CIE : 25 Marks
Credits : 1

Objectives :

- To understand the characteristics of Diode.
- To understand the input and output characteristics of different Transistor configurations.
- To understand the input and output characteristics of FET.
- To study the working of CRO.
- To study the characteristics of different devices, UJT, SCR.

List of Experiments :

1. Study of CRO.
2. Static Characteristics of Diodes (Si, Ge)
3. Static Characteristics and voltage regulation of Zener Diode.
4. Ripple and Regulation characteristics of Half-wave, Full-wave and Bridge rectifiers.
5. Ripple and Regulation characteristics of Half-wave, Full-wave and Bridge rectifiers with Filters (C, L , LC and π)
6. Static Characteristics of CB Configuration of Transistor
7. Static Characteristics of CE Configuration of Transistor
8. Static and Transfer Characteristics of FET.
9. Static characteristics of CS configuration of FET.
10. Characteristics of special device UJT.
11. Characteristics of special device SCR.
12. Characteristics of Light emitting Diode and Photo diode.

Suggested Reading:

1. David Bell. A, Laboratory Manual for Electronic Devices and circuits, Prentice hall of India, 2001.
2. Robert L. Boylestad , Louis Nashelsky "Electronic Devices and Circuit Theory", 11th edition, Pearson Publishers, 2012