Electronic Devices and Circuits

Unit1Semiconductor and Diodes:

Semiconductor-Definition, classification, intrinsic and extrinsic N type & p type – drift current &diffusion current diodes – PN junction diode – forward and Reverse bias characteristics – specification – zener diode construction & working Principle-characteristics - zener break down-avalanche break down- zener Diode as a voltage regulator –applications- specifications Rectifier – introduction-classification of rectifiers-half wave rectifier-full wave Rectifier (centre tapped, bridge) (no mathematical equations)-comparison-Applications-filters-C, LC and PI filters

Unit II Bipolar junction Transistor:

Transistor – NPN and PNP transistor – operation-transistor as an amplifier- transistor as a switch – transistor biasing – fixed bias, collector base bias, self bias – CB, CE, CC configurations – characteristics - comparison between three configurations in terms of input impedance, output impedance, current gain, voltage gain – classification of amplifiers- RC coupled amplifier – emitter follower and its application – negative feedback Concept, effect of negative feedback – types of negative feedback connections

Unit III Transistor Oscillators and FET and UJT:

Transistor oscillator – Classifications – Condition for oscillations (Barkhausen criterion) – General form of LC oscillator – Hartley Oscillator – Colpitts Oscillator – RC Phase shift oscillator- Crystal oscillator. Field Effect Transistor – construction – working principle of FET – difference Between FET and BJT – classification of FET – characteristics of FET – Applications – FET amplifier (common source amplifier). Uni Junction Transistor – construction – equivalent circuit – operation – Characteristics – UJT as a relaxation oscillator

Unit IV SCR, DIAC, TRIAC & MOSFET:

SCR – introduction – working – VI-characteristics -comparison between SCR and transistor – SCR as a switch, controlled rectifier. TRIAC working principle Characteristics – DIAC – characteristics – DIAC as bi- directional switch. MOSFET – types & characteristics of N channel MOSFET and P channel

Unit V Opto Electronics Devices and wave shaping circuits:

Classification of opto electronic devices – symbols, Characteristics, working of LDR, LED, 7 segment LED and LCD– opto coupler - Photo transistor. Clipper, Clamper Circuits and waveforms only – Solar Cell - Principles -Applications. Astable, Monostable and Bi-stable Multivibrators using Transistors -Schmitt Trigger using Transistors.

Text Books:

1. Electronics Devices & Circuits by Salivahanan S, N.Suresh Kumar, A.Vallavaraj Tata McGraw Publication 3rd Edition 2016

2. Electronics Devices and circuit theory by Boyestad & Nashelsky, PHI, New Delhi 2009

Reference Books:

1. Electronic Principles by Malvino-Tata McGraw Hill Publication 2010.

2. Electronic Devices & Circuits by Allen Mottershed An Introduction, PHI

3. Electronics Devices & Circuits by Jacob Millman and Halkias3rd Edition 2010, Tata McGraw – Hill publication Optical Fiber Communication by GerdKeise 5th Edition, Tata McGraw – Hill