Subject Code : RCCSIE2

CC – III – ELECTRONIC DEVICES AND INDUSTRIAL APPLICATIONS

Unit – I : Diodes and BJT.

Intrinsic and extrinsic semiconductors – P type and N type – Semiconductor diode – V – I Characteristics – Diode as a rectifier – Zener diode characteristics – Transistor types – Transistor action – Transistor as an amplifier – CB, CE configurations – Fixed and voltage divider biasing – Operating Point – Thermal runaway.

Unit – II: FET and UJT.

Structure of JFET – JFET characteristics – JFET parameters – Advantages of FET-FET as an amplifier – UJT – Equivalent circuit of UJT – Characteristics of UJT – UJT as a relaxation oscillator.

Unit – III: Thyristors.

Thyristor – SCR – Theory of Operation – Characteristics – Two transistor analogy – SCR – Half and full wave rectifiers – 90 degrees phase control using SCR – DIAC – Characteristics – TRIAC – Characteristics.

Unit – IV : Opto Electronic Devices.

Photo electric theory – Kinetic energy of emitted electrons – Photo emissive cell – Photo multiplier – Photo conductive devices – Avalanche photo diode – Photo field effect transistor – Photovoltaic cells – Photo resistive devices – Photo potentiometric device - Light emitting diode sources – LDR – Photo transistor.

Unit – V: Industrial Applications.

Heating – Resistance welding – Seam welding – Induction heaters – High voltage DC transmission – Static circuit breaker-Over voltage protection-SCR current limiting circuit breaker-Flasher circuits – Time delay circuits – Fan regulator using TRIAC.

Books for study:

1. Basic electronics – B.L Theraja – S. Chand & Co – 1991
2. Principles of electronics – V.K. Mehta – S. Chand & Co - 1991
3. Industrial and power electronics–C. Harish–Raj Umesh Publications–4th Edn. 1992.

Books for Reference:

1. Basic electronics and linear circuits – N.N. Bhargava, D.C.Kulsheshtha and S.C.Gupta – Tata McGraw Hill - 1987.
2. Industrial electronics – G.K. Mithal, Khanna Publications – Delhi – 15th Ed. 1992.