

B.Sc. -V SEMESTER
SUBJECT: ELECTRONICS
THYRISTORS, IC TECHNOLOGY, MICROPROCESSOR

Unit I

UJT – Structural Description, working and characteristics curve of Unijunction Transistor (UJT), UJT as a relaxation Oscillator. **SCR** – constructional features, principle of operation, modes of operation SCR terminology, turn-on methods, turn-off methods, triggering methods of SCR circuits, Two Transistor Analogy of SCR, Construction, working and characteristics curve of DIAC and TRIAC,

Unit II

Applications of SCR – SCR as a switch, Phase controlled Rectification, Half wave and full wave Rectifiers using SCR with resistive, capacitive and inductive load. **Power Inverters using SCR:** with and without reactive feedback. **Chopper:** Basic Principle, construction, working and waveforms of Morgan and Jones Choppers.

Unit III

IC Technology:

Advantages and limitations of IC, Silicon Substrate Preparation: Refining and growth of silicon crystal, production of electronic grade silicon, crystal growth apparatus Silicon Wafer preparation: Ingot trimming and slicing, Wafer polishing and cleaning Diffusion: Basic of diffusion of dopant impurities, types of diffusion, diffusion systems. **Ion Implantation:** Ion Implantation system, properties of Ion Implantation, high current high energy Implantation machines. **Oxidation:** Thermal oxidation, Utility of thermal oxidation, Growth and properties of Oxide Layers on Silicon. **Photolithography:** Steps of photolithography process. Idea of photo resists & etching, Chemical Vapor Deposition Process: Epitaxial deposition. Metallization process

Unit IV

INTEL 8086 Microprocessor: Register Organization of INTEL 8086, Architecture, Signal Descriptions of 8086, Physical Memory Organization, General Bus Operation, I/O Addressing Capability, Minimum and Maximum modes.

Addressing Modes of 8086, Instruction set of 8086: Data copy/Transfer Instructions, Arithmetic and Logical Instructions, Branch Instructions, Loop Instructions, Machine control Instructions, Shift and Rotate Instructions. Simple programs for arithmetic operations.

Unit V

Electrical Motors:

Types of motors, DC Motor: Design & working principles; Induction Motor: Idea of rotating magnetic field, starting & rotating torque, slip, Asynchronous motor, equivalent circuit of an induction motor. Synchronous motor: principle of operation. Single phase induction motor; different circuits to make it self starting.

B.Sc. -VI SEMESTER
SUBJECT: ELECTRONICS
COMMUNICATION ELECTRONICS

Unit I

Noise: Thermal noise, shot noise, partition noise, low frequency and transit time noise, Generation and recombination noise, Equivalent- noise resistance, signal to noise ratio, Noise factor, Noise temperature.

Radio wave Propagation: Introduction, propagation in free space, Tropospheric propagation, Ionosphere propagation, surface wave, LF and VLF propagation, ELF propagation, Ground wave, sky wave and space wave propagations, dead zone, skip distance, maximum usable frequency (MUF), Stratification of Ionosphere.

Unit II

Modulation: Principle of modulation

Amplitude Modulation: Principle and waveform, modulation index, deviation for the modulated wave and modulation index, linear and square modulators, balanced modulators, single side band transmission: advantages, disadvantages, methods of generation.

Elements of frequency and phase modulation, Frequency spectrum of FM waves, Phase modulation, modulation Indices.

Unit III

Generation of Frequency Modulation: Direct and indirect methods, Varactor diodes and FET circuits, FM demodulation:-Foster Seely Discriminator and Ratio Detector

Pulse Modulation, Pulse Transmission, Pulse amplitude modulation, Pulse position and pulse width modulation, Time Division multiplexing.

Pulse Code Modulation: Block diagram of PCM, Transmitting and receiving systems of PCM.

Unit IV

Antenna:- Antenna equivalent circuits, Radiation fields, Polarization, Isotropic radiation, Power gain, effective area, half wave dipole, vertical Antenna, folded elements, loop and ferrite core, receiving antenna, Yagi Antenna, non-resonant antenna, driven arrays, Parasitic array, Microwave Antenna.

Television Engineering:-

Characteristic of Human eye, Persistence of vision and flicker, scanning process, Interlaced scanning, Composite video signal, Vestigial sideband signal, standard channel characteristic, Block diagram of TV Transmitter and Receiver.

Unit V

Fiber Optic Communication- Introduction to optical fibers, principles of light transmission in a fiber, propagation within a fiber, effect of Index profile on propagation, Modes of propagation, number of modes supported by a fiber, losses in fiber , dispersion, light sources for optical fiber ,Photo Detectors, connectors and splices.

Wireless Communication System:-

Introduction to cellular Telephony, cells, frequency re-use, Principle, transmission, Reception, Hand off, Roaming, Generation of cellular Telephony, Global system for mobile communication (GSM), Introduction switching system, Base station system, operation and support system, GSM specification, VSAT.