

Syllabus

1. Junction Diodes

- a. Intrinsic Semi-conductors
- b. Extrinsic Semi-conductors
 - i. n- type
 - ii. p-type
- c. p-n Junction
 - i. Depletion Layer
 - ii. Forward Bias
 - iii. Reverse Bias
- d. Characteristic of a Diode
 - i. I-V curves of Real Diode
 - ii. I-V curves of practical Diode
- e. Uses of Diode as rectifier
 - i. Half wave rectification
 - ii. Full wave rectification
 - iii. Smoothing
- f. Demonstration of rectification using CRO
- g. Diode as a Switch
- h. Other types of Diodes
 - i. Zener Diodes
 - Voltage regulation of Zener diodes
 - ii. Light Emitting Diode (L.E.D)
 - iii. Photo Diode

2. Transistor

- a. Bipolar Transistors
 - i. Structure and circuit symbol of npn and pnp transistors
 - ii. npn transistor circuits
 - Action of Transistors
 - Circuit configuration
 - ✓ Common –Base
 - ✓ Common – Emitter
 - ✓ Common – Collector

- Investigating the characteristics of common emitter configuration of a transistor
 - ✓ Input Characteristic
 - ✓ Output Characteristic
 - ✓ Transfer Characteristic
 - Common Emitter transistor amplifier
 - ✓ Current amplification
 - ✓ Voltage amplification
 - Common Emitter transistor switch
- iii. Unipolar Transistors
- Field effect transistor
 - Structure and circuit symbol of n-channel and channel FETs
 - Action of an n – channel FET
 - ✓ Characteristic
 - ✓ Voltage amplification using FET (Qualitatively)

3. Operational Amplifiers

- a. Operational amplifiers as an Integrated Circuits (IC)
- b. Identification of pins
- c. Action of operational amplifier
- d. Characteristic of the open loop state
- e. Uses of operational amplifier as a voltage amplifier
 - i. Close loop state (negative feedback)
 - Golden Rule I & II
 - Inverting amplifier
 - Non-inverting amplifier
 - ii. Uses of operational amplifier as a voltage comparator

4. Digital Electronics

- a. Boolean expression and truth tables of logical gates
 - i. AND gate
 - ii. OR gate
 - iii. NOT gate
 - iv. NAND gate
 - v. NOR gate
 - vi. EXOR gate

- vii. EXNOR gate
 - viii. Investigating the truth tables of basic logic gates
- b. Logic expressions for simple digital circuits (maximum of three inputs)
- c. Converting a given logic expression to a logic gate circuit
- d. Logic expression for a truth table
- e. Designing simple logic circuits
- f. Electronic memory
 - i. Single memory element with NAND/NOR gates
 - Basic SR flip-flop (Bistable)