

LEARNING OUTCOMES

1. Introduction to Electronics

- Explains the origin and history of the development of Electronics.
- Point out the significance of Electronics in day to day life.
- Classify the applications of Electronics in various fields.
- Classify the important components in electronics as active and passive.
- Recognise, resistors, capacitors and inductors of various types from their physical appearance.
- Identify the value of resistors using their colour coding.
- Draw the symbols of different active and passive components.
- Explain the specifications of various types of resistors, capacitors and inductors.

2. Electrical Fundamentals

- Differentiates the basic parameters of electricity.
- Utilise Ohm's law for solving electric circuits.
- Solve electrical networks.
- Solve networks using Kirchoff's laws.
- Explain the characteristics of ideal voltage and current source.
- Distinguish between DC & AC voltages.
- Explains the characteristics such as frequency and phase of AC voltages.
- Explains the significance of RMS and Average values.
- Explains the concept of impedance.

3. Solid State Devices

- Draw and explain the energy level diagram of an atom.
- Explain the energy bands in solids and classification of solids.
- Explain the properties of semi conductors and their significance.

- Explain the need for doping and how it is done.
- Classify semi conductors on the basis of dopants.

4. Semi Conductor Diode

- Differentiates P-type and N-type semi conductor.
- Explain how depletion region is formed in PN junctions.
- Draw the circuit and this explain the characteristics of a diode under forward and reverse biased conditions.
- Draw and explain the V-I characteristics of a diode.
- Distinguishes between the characteristics of silicon and Germanium diodes.
- Explains different types of breakdown in diodes.
- Draws the circuit diagram and hence explain the working of zener diode and its characteristics.
- Explain the working of zener diode voltage regulator.

5. Transistors

After completing this unit, the learner :

- Explains the significance of transistors in electronic devices and circuits.
- Draws the structure of a bipoles transistor and thus point out the importance of its terminals.
- Points out the importance of different modes of operations of transistors.
- Draws the circuits and explains the applications of different transistor - configurations.
- Explain the input and output characteristics of a CE transistor configuration.
- Construct a DC load line and thus explain its significance.
- Explains the working of transistor as a switch.

6. Special Devices

- Explains the working of FET
- Identifies power electronic devices such as SCR, TRIAC, DIAC and UJT and illustrates their applications.

- Explains the working and applications of LED.
- Explains the working and application of LDR, photodiode, phototransistor and solar cell.
- Distinguishes between the features of LED and LCD displays.
- Describes the application of varicap and thermistor.
- Explains the advantages of IC technology and understands the features of some typical ICs. and list their applications.

7. Introduction to Electronics

- Explains the need for rectifiers
- Demonstrates and thus explain how a diode acts as a rectifier.
- Explains the working of a half wave rectifier.
- Derives and calculates the efficiency of rectifier.
- Explains the concept of ripple factor.
- Explains the working of full wave rectifier.
- Distinguishes between RMS and average values of rectified output.
- Explains the need for filter circuits in rectifiers.

8. Transistor as an amplifier

- Explains the concept of amplification.
- Explains the use of transistor as an amplifier.
- Identifies the need for biasing circuits in amplifiers.
- Explains the frequency response of amplifiers.
- Explains the significance of operational amplifiers.
- Illustrates the operation of inverting and non-inverting amplifier

9. Oscillators

- Points out the needs for oscillators
- Explains the generation of oscillations
- Explains the working of a tank circuit
- Points out the significance of feedback
- Explains barkhausen criterion for oscillations
- Explains the generations of oscillations in RC oscillators

- Explains the construction of RC oscillators
- Draws the circuit diagram and thus explains the working of squarewave generator.

10. Digital Electronics

- Explains different types of number systems and performs conversion from one system to the other
- Performs binary addition
- Identifies the symbols and forms the truth tables of various logic gates.
- Describes the universal property of NAND and NOR gates.
- Describes the operation of half adder and full adder and explains how two binary numbers are added using them.

11. Measuring Instruments

- Explains how to convert a galvanometer into ammeter and voltmeter
- Explains the internal structure of a CRO
- Describes the measurements using CRO
- Explains the principle of operation and uses of seven segment and dot-matrix displays
- Explains how to convert a galvanometer into ammeter and voltmeter
- Explains the internal structure of a CRO
- Describes the measurements using CRO
- Explains the principle of operation and uses of seven segment and dot-matrix displays