

## EE151: BASIC ELECTRICAL & ELECTRONICS ENGINEERING

CREDITS = 6 (L=4, T=0, P=2)

A

### Electrical Engineering

- 1 **Fundamental of Electricity:** Types of supply, Basic terms associated with Electricity like Current, Voltage, Power, Power factor, frequency etc. 2 Hours
- 2 **Flow of Electrical power** from generating station to consumers, Block diagram of Electricity Generation. Transmission & Distribution system. Importance of power transformers. 3 Hours
- 3 **Basic requirements of Electric Wiring.** Types of Wiring. Precautions to be taken during Electrical wiring. Importance of Electrical Earthing. Methods of Earthing. Electrical Shocks and its effect on human boy, Care & Curing methods for Electrical shock, Precaution against electrical shock 3 Hours
- 4 **Types of Power station:** Brief explanation of working & block diagram for layout of Power stations. Types of alternative source of energy& its importance. 3 Hours
- 5 **Types of AC & DC motors:** Salient features (Working principle & output characteristics) of DC motors & their applications. Salient features of Induction motors & their applications. Comparison of Induction Motor & Synchronous Motor. Application of Synchronous Motor. 6 Hours
- 6 **Domestic appliances & Special Motors:** Brief principle and working of special AC motors used in domestic appliance; Stepper motor and Servomotor. 3 Hours

B

### Electronics Engineering

- 1 **Basics of Electronics:** Basic operation of PN junction diode and bi-polar junction transistor, Basic requirements and characteristics of Rectifier, Amplifier and Oscillator. 3 Hours
- 2 **Logic Circuits:** Study of logic gate, flip-flops, Shift registers and counters and their applications. 4 Hours
- 3 **Integrated Circuits:** Brief explanation of working OPAMP IC and its applications. Timer IC 555- its working & applications. 4 Hours
- 4 **Electronic Instruments:** Operation of digital Multi-meter. Working of Cathode Ray Tube, Block diagram and working of CRO. Measurement of various electrical quantities using CRO. 4 Hours
- 5 **Electronic Communications:** Brief explanation of Modulations & Demodulations. Working & block diagram of Radio receiver. Overview of fiber optic communication. 5 Hours

**REFERENCE BOOKS:**

**Title:** A text book of Electrical Technology Vol. I & II  
**Author:** B. L. Theraja & A. V. Theraja  
**Publisher:** S. Chand & Company Limited – Delhi

**Title:** Elements of Electrical Engineering & Electronics  
**Author:** U. A. Patel  
**Publisher:** Atul Prakashan – Ahmedabad

**Title:** Electrical wiring, Estimation & Costing  
**Author:** S. L. Uppal  
**Publisher:** Khanna Publishers – Delhi

**Title:** Basic Electrical and Electronics Engineering  
**Author:** J. C. Panchal, Bhuvanesh Oza & Vishvjit Thakar  
**Publisher:** Roopal Prakashan – Vallabh Vidyanagar

**Title:** Modern Electrical & Electronics Practice  
**Author:** M. R. Patel & R. M. Patel  
**Publisher:** Akshat Publication & Distributors – Surendranagar

**LIST OF PRACTICALS:****A Electrical Engineering**

- 1 Verification of Circuit laws for DC circuits.
- 2 Verification of circuit laws & concepts for AC circuits
- 3 Wirings of Domestic equipments.
- 4 Characteristics of DC shunt motor.
- 5 Characteristics of DC series motor.
- 6 Characteristics of Induction motor.
- 7 MCB characteristics

**B Electronics Engineering**

- 1 VI Characteristic of PN Junction Diode.
- 2 Output characteristic of Common Emitter Transistor Circuit.
- 3 Verification of Truth table of Logic gates and Flip Flop.
- 4 Measurement of frequency, phase difference, Amplitude, etc. with CRO.
- 5 Inverting, non-inverting, adder circuit using OPAMP
- 6 Demonstration of Amplitude Modulation.