

Table of Contents

1. **Introduction to Electrical Engineering**
 - Basic electrical quantities and units
 - Voltage, current, power, and energy
 - Fundamental electrical laws
2. **DC Electrical Circuits**
 - Ohm's Law
 - Kirchhoff's Laws
 - Series and parallel circuits
 - DC circuit analysis
3. **Electrical Network Theorems**
 - Thevenin's Theorem
 - Norton's Theorem
 - Superposition Theorem
 - Millman's Theorem
 - Maximum Power Transfer Theorem
4. **Magnetic Circuits**
 - Magnetic fields
 - Magnetic flux and magnetomotive force
 - Reluctance
 - Magnetic circuit analysis
5. **Electromagnetic Induction**
 - Faraday's Law
 - Lenz's Law
 - Induced electromotive force
 - Inductance and magnetic energy
6. **Fundamentals of AC Circuits**
 - Sinusoidal waveforms
 - Average and RMS values
 - Phase and phase difference
 - Phasor representation
7. **AC Circuit Analysis**
 - Impedance and admittance
 - R, L, and C circuits
 - RLC circuits
 - Active, reactive, and apparent power
 - Power factor
8. **Three-Phase Circuits**
 - Three-phase systems
 - Star and delta connections
 - Three-phase power
 - Power measurement
9. **Electrical Measuring Instruments**
 - Principles of electrical measurement
 - Ammeters and voltmeters
 - Wattmeters
 - Analog and digital instruments

10. Transformers

- Operating principle
- Transformer construction
- Transformation ratio
- Ideal and practical transformers
- Efficiency and voltage regulation

11. Electrical Machines

- Basic principles of electrical machines
- DC generators
- DC motors
- AC motors and generators

12. Introduction to Electrical Power Systems

- Electrical power generation
- Transmission and distribution
- Electrical networks
- Electrical loads

13. Electrical Safety and Applications

- Earthing and grounding
- Protection against electric shock
- Electrical protection devices
- Industrial electrical applications