

Table of Contents

1. Electricity

- Electric charge and current
- Voltage and potential difference
- Resistance and resistors
- Ohm's law
- Electrical power and energy
- Basic electrical quantities

2. DC Circuits

- Series and parallel circuits
- Kirchhoff's laws
- Voltage and current division
- Equivalent circuits
- Thevenin's theorem
- Circuit analysis

3. AC Circuits

- Alternating voltage and current
- RMS and peak values
- Capacitors and inductors
- Reactance and impedance
- Phase relationships
- AC power

4. Diodes

- Semiconductor principles
- p-n junctions
- Forward and reverse bias
- Rectification
- Zener diodes
- Diode applications

5. Bipolar Junction Transistors

- Transistor structure
- NPN and PNP transistors
- Transistor characteristics
- Biasing
- Current gain
- Transistor applications

6. Common-Emitter Amplifiers

- Amplifier principles
- Voltage gain
- Current gain
- Input and output impedance
- Biasing and load lines
- Common-emitter amplifier operation

7. I/O Impedance

- Input impedance
- Output impedance
- Loading effects
- Impedance matching
- Signal transfer

8. Field-Effect Transistors

- JFETs
- MOSFETs
- FET characteristics
- Biasing
- Amplification
- FET applications

9. High-Frequency Electronics

- High-frequency behaviour
- Frequency response
- Capacitive and inductive effects
- Bandwidth
- High-frequency limitations

10. Transients

- Transient response
- RC circuits
- RL circuits
- Time constants
- Charging and discharging
- Switching behaviour

11. Digital Electronics

- Digital signals
- Logic gates
- Boolean logic
- Flip-flops
- Digital circuits
- Karnaugh maps
- Basic logic applications

12. Operational Amplifiers

- Op-amp principles
- Inverting and non-inverting configurations
- Voltage gain
- Feedback
- Summing and differential amplifiers
- Practical op-amp applications

13. Power Supplies

- AC-to-DC conversion
- Rectifiers
- Smoothing and filtering
- Voltage regulation
- Zener regulation
- Basic regulated power supplies

14. Laboratory

- Basic electronics experiments
- Circuit construction
- Electrical measurements
- Component testing
- Experimental procedures
- Practical verification of electronic principles