

Foundations of Electrical Engineering

Electrical Engineering · Answer Key · 18 Questions

1. Which unit is defined as one joule of energy per coulomb of charge?

- A) Ampere
- B) Volt**
- C) Ohm
- D) Watt

2. According to Ohm's Law, what happens to the current in a circuit if the resistance is doubled while the voltage remains constant?

- A) It doubles
- B) It remains the same
- C) It is halved**
- D) It quadruples

3. What is the primary function of a capacitor in an electrical circuit?

- A) To resist current flow
- B) To store energy in an electric field**
- C) To convert AC to DC
- D) To increase voltage levels

4. In a series circuit consisting of three resistors with values 2 Ω , 3 Ω , and 5 Ω , what is the total resistance?

- A) 1.0 Ω
- B) 10 Ω**
- C) 30 Ω
- D) 0.1 Ω

5. Which component is used to limit or regulate the flow of electrical current in an electronic circuit?

- A) Transistor
- B) Diode
- C) Resistor**
- D) Capacitor

6. What does a diode allow to happen in an electrical circuit?

- A) Store energy
- B) Amplify a signal
- C) Allow current to flow in one direction**
- D) Increase the voltage

7. Which device is used to transform electrical energy from one voltage level to another using electromagnetic induction?

A) Generator

B) Transformer

C) Rectifier

D) Inverter

8. What is the SI unit for electrical capacitance?

A) Henry

B) Farad

C) Coulomb

D) Weber

9. In a parallel circuit, which of the following quantities remains constant across all branches?

A) Current

B) Voltage

C) Power

D) Resistance

10. Which material is commonly used as a semiconductor in the manufacturing of transistors?

A) Copper

B) Silicon

C) Aluminum

D) Rubber

11. What happens to the magnetic field strength of an electromagnet if the number of turns in the coil is increased?

A) It decreases

B) It stays the same

C) It increases

D) It reverses polarity

12. What is the standard frequency of alternating current (AC) in most Australian residential power grids?

A) 50 Hz

B) 60 Hz

C) 100 Hz

D) 120 Hz

13. Which law states that the sum of currents entering a junction must equal the sum of currents leaving it?

A) Ohm's Law

B) Kirchhoff's Current Law

C) Faraday's Law

D) Lenz's Law

14. What is the relationship between power (P), voltage (V), and current (I)?

A) $P = V / I$

B) $P = I / V$

C) $P = V * I$

D) $P = V^2 * I$

15. What unit is used to measure electrical inductance?

A) Tesla

B) Henry

C) Siemens

D) Joule

16. Which electrical safety device is designed to break a circuit when current exceeds a safe limit?

A) Transformer

B) Fuse

C) Capacitor

D) Transistor

17. What is the primary purpose of an inverter in an electrical system?

A) Convert DC to AC

B) Step down AC voltage

C) Store DC charge

D) Increase resistance

18. What material property determines how easily electrons can flow through a substance?

A) Inductance

B) Conductivity

C) Capacitance

D) Reluctance