Electrical Engineering and the Natural World

Electrical Engineering · Practice Test · 18 Questions

1. Some electric eels generate powerful electric shocks for defense. What is the primary unit of electrical current that describes the flow of charge?

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

2. Bioluminescent organisms, like fireflies, produce light through a chemical reaction. The energy conversion in such processes is related to what fundamental electrical property?

A) Resistance
B) Capacitance
C) Inductance
D) Voltage

3. The electrical signals that nerve cells use to communicate are measured in terms of potential difference. What unit is used to measure electrical potential difference (voltage)?

A) Ampere
B) Ohm
C) Coulomb
D) Volt

4. Lightning is a massive natural electrical discharge. What is the SI unit for electrical resistance, which opposes the flow of current?

A) Volt
B) Watt
C) Ohm
D) Joule

5. Photosynthesis in plants converts light energy into chemical energy. The efficiency of this energy conversion is a concept studied in electrical engineering related to power. What unit measures the rate of energy transfer or power?

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

6. The earth's magnetic field, which helps guide migrating birds, is generated by electrical currents. The flow of these charges is known as what?

A) Voltage
B) Resistance
C) Current
D) Power

7. Hydroelectric dams generate electricity from the flow of water. The ability of a material to conduct electricity is quantified by its conductance. What electrical property is the inverse of resistance?

A) Capacitance
B) Inductance
C) Conductance
D) Voltage

8. Some fish can detect weak electrical fields generated by other organisms for navigation and hunting. The strength of an electrical field is related to the electric potential. What is the SI unit for electric charge?

A) Ampere
B) Volt
C) Ohm
D) Coulomb

9. The aurora borealis is caused by charged particles from the sun interacting with the Earth's atmosphere. The flow of these charged particles is a form of electric what?

A) Voltage
B) Resistance
C) Power
D) Current

10. Static electricity, often experienced on dry days, involves an imbalance of electric charges on surfaces. The measure of the opposition to this charge flow is called resistance. What electrical component is designed to impede the flow of current?

A) Capacitor
B) Inductor
C) Resistor
D) Diode

11. Plants have electrical signals that can respond to stimuli, though much slower than animal nerves. The storage of electrical energy in an electric field is a function of what component?

A) Resistor
B) Inductor
C) Capacitor
D) Transistor

12. The process of electrolysis, used in some industrial applications and observed in natural geological processes, involves using electricity to drive chemical reactions. This requires a driving electrical force. What is the unit of electrical voltage?

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

13. Solar panels convert sunlight directly into electricity. The efficiency of this conversion is related to how well they absorb photons and generate electron flow. The rate at which electrical energy is produced or consumed is measured in what units?

A) Volts
B) Amperes
C) Ohms
D) Watts

14. Some fungi can transmit electrical signals through their mycelial networks, potentially for communication or resource distribution. The path of least resistance is crucial for efficient signal transmission. What property measures how much an object resists electric current?

A) Conductance
B) Voltage
C) Capacitance
D) Resistance

15. The movement of ions across cell membranes in organisms is a fundamental electrical process. The total amount of electrical charge that flows over time is measured in what SI unit?

A) Volt
B) Ampere
C) Coulomb
D) Ohm

16. Wind turbines harness kinetic energy from wind to generate electricity. The operational capacity of a wind turbine is often rated by its power output. What is the SI unit of power?

A) Joule
B) Watt
C) Volt
D) Ampere

17. Geothermal power plants tap into the Earth's internal heat to produce electricity. The energy produced is a result of the flow of heat, which can be analogized to the flow of electrical charge. What measures the rate of electrical charge flow?

A) Resistance
B) Voltage
C) Power
D) Current

18. The electrical signals used by plants to respond to touch or damage are carried by changes in ion concentrations across cell membranes. These changes create an electrical potential. What is the unit of electrical potential difference?

A) Ampere
B) Ohm
C) Coulomb
D) Volt