Fundamentals of Electrical Engineering

Electrical Engineering · Answer Key · 15 Questions

1. Which law states that the algebraic sum of currents meeting at a junction in an electrical circuit is zero?

A) Ohm's Law
B) Kirchhoff's Current Law
C) Faraday's Law
D) Ampere's Law

2. In an AC circuit, what does the power factor represent?

A) The ratio of real power to apparent power
B) The difference between peak and RMS voltage
C) The total impedance of the circuit
D) The frequency of the alternating current

3. What is the unit of magnetic flux density?

A) Henry
B) Weber
C) Tesla
D) Coulomb

4. Which component is used to store energy in a magnetic field?

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

5. What happens to the resistance of a pure metal conductor when its temperature increases?

A) It remains constant
B) It decreases
C) It increases
D) It fluctuates randomly

6. In a three-phase power system, what is the phase difference between each phase voltage?

A) 60 degrees
B) 90 degrees
C) 120 degrees
D) 180 degrees

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7. The skin effect in conductors causes current to concentrate where?

A) At the center of the conductor
B) At the surface of the conductor
C) Uniformly across the cross-section
D) At the base of the conductor

8. Which parameter is defined as the ability of a material to permit the flow of magnetic flux?

A) Permittivity
B) Conductance
C) Permeability
D) Susceptance

9. What is the primary function of a transformer?

A) To convert AC to DC
B) To change voltage levels using electromagnetic induction
C) To increase the frequency of a signal
D) To store electrical charge

10. What type of material has a resistivity typically between that of conductors and insulators?

A) Superconductors
B) Dielectrics
C) Semiconductors
D) Ferromagnets

11. According to Lenz's Law, the direction of an induced electromotive force is such that it opposes what?

A) The applied voltage
B) The change in magnetic flux that produced it
C) The flow of current in the circuit
D) The resistance of the conductor

12. What is the value of the Q-factor in a series RLC circuit at resonance?

A) Resistance divided by inductive reactance
B) Inductive reactance divided by resistance
C) Capacitive reactance multiplied by resistance
D) Frequency divided by impedance

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13. Which device is used to measure the power factor of a circuit?

A) Ammeter
B) Voltmeter
C) Cos-phi meter
D) Ohmmeter

14. In an ideal operational amplifier, what is the value of the input impedance?

A) Zero
B) Finite
C) Infinite
D) Variable

15. What is the relationship between the peak value and the RMS value of a pure sinusoidal AC waveform?

A) Peak = RMS / sqrt(2)
B) Peak = RMS * sqrt(2)
C) Peak = RMS * 2
D) Peak = RMS / 2