

► Electrical and Electronic Systems Questions

1. The power dissipated by a 4Ω resistor connected to a 12V D.C. supply is:
 - (a) 36W
 - (b) 12W
 - (c) 6W
 - (d) 4W

2. Kirchhoff's Voltage Law states that the algebraic sum of voltages around a closed loop
 - (a) is equal to the applied voltage
 - (b) is equal to the current multiplied by the resistance
 - (c) is always positive
 - (d) is zero

3. The total resistance of three 2Ω resistors connected in parallel across a 12V D.C. supply is:
 - (a) 6Ω
 - (b) 18A
 - (c) 0.66Ω
 - (d) 6A

4. Magnetomotive force is proportional to current multiplied by the number of turns in a coil. It has units:
 - (a) Webers
 - (b) Teselas
 - (c) mmf
 - (d) Amps

5. In electromagnetic theory, the reluctance of a circuit is analogous to:
 - (a) Resistance
 - (b) Capacitance
 - (c) Voltage
 - (d) Current

- 6.** The inductance of a coil is proportional to all of the following, except:
- (a) the number of turns in the coil squared
 - (b) the circumference of the coil
 - (c) the permeability of free space
 - (d) the cross sectional area of the coil
- 7.** Fleming's Left Hand Rule states that the following three entities will be at right angles to each other:
- (a) force, motion and current
 - (b) force, inductance and current
 - (c) voltage, field and inductance
 - (d) current, force and field
- 8.** Two 2nF capacitors are connected in parallel. The arrangement is then connected in series with a 4nF capacitor. The total capacitance is:
- (a) 1nF
 - (b) 2nF
 - (c) 5nF
 - (d) 8nF
- 9.** A 4nF capacitor is connected to a 12V D.C. supply. The total energy supplied in charging the capacitor is:
- (a) 24×10^{-9} Joules
 - (b) 48×10^{-9} Joules
 - (c) 288×10^{-9} Joules
 - (d) 576×10^{-9} Joules
- 10.** The time taken to fully charge a capacitor is:
- (a) inversely proportional to the voltage supplied
 - (b) proportional to the capacitance
 - (c) inversely proportional to the current
 - (d) infinite

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11. Fleming's Right Hand Rule states that the following three entities will be at right angles to each other:

- (a) force, emf and field
- (b) motion, force and emf
- (c) motion, emf and current
- (d) force, field and current

12. The rms voltage for a 240V A.C supply is:

- (a) 15.5V
- (b) 120V
- (c) 169.7V
- (d) 240V

13. A 100V rms 50Hz alternating voltage supply is connected to a 159nF capacitor. Calculate the current.

- (a) +j 2A
- (b) +j 5mA
- (c) -j 2A
- (d) +j 5A

14. A 100V rms ac supply feeds a 200 Ω resistor in series with a 100mH inductor. Calculate the power dissipated when the frequency is 50Hz.

- (a) 4W
- (b) 8W
- (c) 24W
- (d) 48W

15. A balanced 3-phase 415V (line) 50Hz supply has a phase voltage of:

- (a) 83V
- (b) 240V
- (c) 293V
- (d) 415V

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- 16.** For a delta or mesh connected load with a line voltage of 415V, the phase voltage is:
- (a) 83V
 - (b) 240V
 - (c) 293V
 - (d) 415V
- 17.** The total power dissipation in a delta connected load is:
- (a) the same as a star connected load
 - (b) twice the power dissipated in a star connected load
 - (c) thrice the power dissipated in a star connected load
 - (d) one third the power dissipated in a star connected load
- 18.** A thyristor acts like a diode but has an additional terminal called a gate. The gate:
- (a) should be connected to a low voltage trigger
 - (b) provides an additional input channel
 - (c) enables the current to be rectified
 - (d) allows current to be drawn
- 19.** The average D.C. voltage from the circuit in Figure 5.56 in the textbook when the input is a 50V rms A.C. supply is:
- (a) 25V
 - (b) 45V
 - (c) 50V
 - (d) 141V
- 20.** The average dc output from the smoothed uncontrolled half wave rectifier shown in Figure 5.57 in the textbook is 12V, the load resistance is 600Ω and the supply frequency is 50Hz. The value of capacitance necessary to provide a ripple voltage of less than 0.5V is:
- (a) $20\mu\text{F}$
 - (b) $40\mu\text{F}$
 - (c) $80\mu\text{F}$
 - (d) $100\mu\text{F}$