

## QUIZ – ANSWER KEY

QUIZ NO: 139

TOPIC: ELECTRICAL ENGINEERING

DATE: 28/12/2022

1. Which of the following elements of electrical engineering cannot be analyzed using Ohm's law?

- [A] Capacitors
- [B] Inductors
- [C] Transistors
- [D] Resistance

**Answer: C**

**Explanation:** Ohm's law cannot be used for unilateral networks as such networks only allow current flow in one direction. Transistor forms a unilateral network. Thus, Ohm's law cannot be used on Transistors.

2. What is constant for a charged spherical shell according to basic electrical energy?

- [A] Electrical potential outside the spherical shell
- [B] Electrical potential inside the spherical shell
- [C] Electrical field outside the spherical shell
- [D] Electrical field inside the spherical shell

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**Answer: B**

**Explanation:** According to principles of electrical energy, the electrical potential inside the spherical shell is constant and is represented as  $V = kq/R$  where  $k = 1/4\pi\epsilon_0$ . This potential is the same as that of the potential on the surface of the sphere.

3. Where does electro-static shielding occur in a charged spherical shell?

- [A] When electrical potential outside spherical shell is zero
- [B] When electrical potential inside the spherical shell is zero
- [C] When electrical field outside the spherical shell
- [D] Electrical field inside the spherical shell

**Answer: D**

**Explanation:** The electrical field inside the spherical shell is zero and this is basically known as electrostatic shielding. The electric field outside the sphere is inversely proportional to the square of the radius.

4. Which of the following is a correct representation of peak value in an AC Circuit?

- [A] RMS value/Peak factor
- [B] RMS value\*Form factor
- [C] RMS value/Form factor
- [D] RMS value\*Peak factor

**Answer: D**

**Explanation:** A peak factor in an AC circuit represents the ratio of the peak value to the RMS value. The peak factor also called the crest factor indicates how extreme the peaks are present in a waveform.

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5. Which of the following according to fundamentals of electrical energy is correct about alternating current?

- [A] Frequency is zero
- [B] Magnitude changes with time
- [C] Can be transported to larger distances with less loss in power
- [D] Flows in both directions

**Answer: A**

**Explanation:** An alternating current changes its value with time and flows in both directions. The loss in power is less due to alternating current properties and thus, can be transported to larger distances.

6. How many cycles will an AC signal make in 2 seconds if its frequency is 100 Hz?

- [A] 50
- [B] 100
- [C] 150
- [D] 200

**Answer: D**

**Explanation:** In electrical engineering, the frequency represents the ratio of the number of cycles to the total time. Since frequency is given as 100 Hz and the time is 2 sec thus a total of 200 cycles will be made.

7. What will be the direction of the drift velocity of electrons change with respect to the electric field?

- [A] same as that of electric field
- [B] opposite to that of electric field
- [C] perpendicular to that of the electric field in a positive direction
- [D] perpendicular to that of the electric field in a negative direction

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**Answer: B**

**Explanation:** Basically drift velocity can be said to be the average velocity obtained by the free electrons in metal when an electric field is applied. The direction of drift velocity for the electrons present in metal will be opposite to that of the applied electric field.

8. Which of the following is correct about the power consumed by  $R_1$  and  $R_2$  connected in series if the value of  $R_1$  is greater than  $R_2$ ?
- [A]  $R_1$  will consume more power
  - [B]  $R_2$  will consume more power
  - [C]  $R_1$  and  $R_2$  will consume the same power
  - [D] The relationship between the power consumed cannot be established

**Answer: A**

**Explanation:** In the electrical engineering introduction it is explained that the power can be expressed as  $P = I^2 \cdot R$ . When two resistors are connected in series the current flowing through the resistors is the same and thus, power consumed by the larger resistor will be more.

9. What is zero for a charged spherical shell?
- [A] Electrical potential outside the spherical shell
  - [B] Electrical potential inside the spherical shell
  - [C] Electrical field outside the spherical shell
  - [D] Electrical field inside the spherical shell

**Answer: D**

**Explanation:** According to the fundamentals of the electrical field inside the spherical shell is zero and this is known as electrostatic shielding. The electric field outside the sphere is inversely proportional to the square of the radius.

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10. What kind of quantity is an Electric potential?

- [A] Vector quantity
- [B] Tensor quantity
- [C] Scalar quantity
- [D] Dimensionless quantity

**Answer: C**

**Explanation:** Electric potential refers to the work done to bring a unit positive charge from a point with higher potential to a point with lower potential. Since electric potential only has magnitude but no direction, it is a scalar quantity.

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