

Question 1: Why are copper wires used as connecting wires?

ANSWER: Copper wire is used as connecting wires because they have low resistivity.

Question 2: Why should an electrician use rubber gloves while repairing an electric switch at your home? Explain.

ANSWER: An electric switch is an electrical appliance. It conducts electricity through its internal parts. When its internal parts are touched with naked hands, then it may cause an electric shock. Therefore, it should be touched with rubber gloves in hand because rubber cannot conduct electricity. Hence, electricians wear rubber gloves while repairing a switch or any other electrical appliance.

Question 3: Handles of tools such as screwdrivers and pliers used by electricians for repair work usually have plastic or rubber cover on them. Can you explain why?

ANSWER: Rubber is a bad conductor of electricity. It does not allow current to flow through it. Hence, handles of tools such as screwdrivers, pliers, etc. which are used by electricians for repair work usually have plastic or rubber cover on them. This protects them from electric shocks.

Question 4: Using the 'conduction tester' on an object, it was found that the bulb begins to glow. Is the object a conductor or an insulator? Explain.

ANSWER: When the two free ends of a conductor tester are touched with an object, then the bulb of the tester would glow if the object conducts electricity. However, the bulb would not glow if the object does not conduct electricity. Since the bulb glows when the tester is touched with the object, the object must conduct electricity. Hence, the object is a conductor.

Question 5: How can you make an iron strip into a magnet?

ANSWER: Take a bar magnet and place its pole near one edge of the iron bar. Without lifting the bar magnet, move it along the length of iron bar. Move the magnet again along the iron bar. Repeat it 30-40 times. Check whether it has become a magnet. If not continue the process for some more time.

Question 6: Can current flow through a bulb with a broken filament? Why?

ANSWER: No, current can not flow through a broken filament because of an incomplete circuit.

Question 7: Liquids cannot conduct electricity. Do you agree? Justify your answer by giving examples.

ANSWER: The conduction of electricity inside the liquid takes place due to the movement of ions. So, some liquids can conduct electricity due to the presence of some salts which can produce ions. Whereas some liquids do not conduct electricity because of zero or low presence of salts which can produce ions.

Question 8: Electric wires used at home have a coating of plastic. Why is this necessary?

ANSWER: Electric wires used at home have a coating of plastic to protect us from shock. If there will not be a plastic coating then there are chances that we may touch the conducting wires and due to the unintentional flow of high current through our body, we may get a shock and may even die.

Question 9: You are a scientist who has to make a satellite to send into orbit in outer space. Which of these will you use as a source of power in the satellite?

- (a) dry cells
- (b) solar cells
- (c) rechargeable cells of the type used in cars
- (d) rechargeable button cells

ANSWER: (b) Solar cells

Solar cells are used because solar cells directly convert solar energy into electrical energy. Since, satellites in orbit are exposed to large amount of sunlight, they can power their systems using solar cells.

Question 10: Name the circuit component that is used to start or stop the flow of current in a circuit.

ANSWER: A switch is a component in a circuit which is used to start or stop the flow of current in a circuit.

Question 11: Will electric current flow in a circuit in which there is a gap between two wires?

ANSWER: No. Electric current will not flow in a circuit in which there is a gap between them. This is because gap contains air and air does not conduct electricity.

Question 12: When is an electric circuit said to be closed?

ANSWER: An electric circuit is said to be closed or complete when there is flow of electricity through the circuit. When the two ends of a cell are connected to a bulb using metal wires, the bulb emits light. The bulb glows due to flow of electric current from the positive terminal to the negative terminal through the filament of the bulb. Such a circuit is called a closed circuit.

Question 13: Why is an electric cell needed in an electric circuit?

ANSWER: An electric cell is needed in an electric circuit because it is the source of electrical energy in a circuit. The energy provided by the cell drives an electric current in the circuit.

Question 14: Differentiate between conductors and insulators. Give three examples of each, one of them being a liquid.

ANSWER:

Conductors	Insulators
Materials which allow current to pass through them are known as conductors.	Materials which do not allow current to pass through them are known as insulators.
Conductors consist of free electrons as charge carriers.	Insulators do not possess charge carriers.
Examples of conductors are: copper, silver and mercury. Mercury is a liquid metal.	Examples of insulators are: plastic, wood and oil. Oil is a liquid insulator.

Question 15: Instead of plastic, can the electric wires at home be covered with aluminium foil? Justify your answer.

ANSWER: The covering of an electric wire is made of plastic because plastic is an insulator, which does not allow current to flow through it. As a result, a person touching the wire is saved from getting shocked. If instead of plastic the wire is covered with aluminium foil, it can be dangerous as the aluminium foil is a conductor and can conduct electricity and lead to shocks.

Question 16: Where is the electricity used at home generated? How does it reach out houses?

ANSWER: Electricity used at home is generated from large power generating stations. Electric current produced from these stations flows to the substations and then reaches our homes through thick wires on poles known as overhead wires (power lines). In some countries, the power lines can also run underground.

Question 17: A bare wire carrying an electric current can give you an electric shock. Based on this, can you say if your body is a conductor or an insulator?

ANSWER: The human body is made up of more than 70% water, and is a good conductor of electricity. As a result, you will get a shock when you come into contact with a bare, current carrying wire.

Question 18: As a safety measure, you are advised to wear rubber slippers or shoes when handling electrical appliances. Why?

ANSWER: Electrical appliances carry large amounts of electrical current. Human body is a good conductor of electricity and current can easily pass through the body to the ground leading to electric shocks. Hence, it is advised to wear rubber gloves, slippers or shoes when dealing with electrical appliances as rubber acts as an insulator and breaks the circuit to the ground. This prevents current from flowing through the body.

Question 19: Current in a circuit flows from the positive terminal of a cell to the negative terminal. In which direction does the current flow inside the cell?

ANSWER: In a circuit, electric conventional current flows from the positive terminal of the cell to the negative terminal. You can think of this as a positive charge moving from the positive terminal of the cell to the negative terminal. Once the positive charge reaches the negative terminal, it moves inside the cell from the negative terminal, back to the positive terminal.

Therefore, conventional current is assumed to flow from the negative terminal to the positive terminal inside the cell.

Question 20: Why are only solar cells used as a source of power in satellites?

ANSWER: Satellites are artificial machines which orbit around celestial bodies to gather information or for communication. Satellites get their power from solar panels. A solar panel is a collection of solar cells which generates electricity directly from the light of the sun. As long as a satellite gets sufficient sunlight, it will keep producing enough electricity to power its onboard systems and there is no need to replenish batteries, which cannot be done easily once the satellite is launched.