11.CURRENT ELECTRICITY

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

Multiple choice question type:

1. b) Conductors
Explanation:
Materials that allow electric current to pass through them easily are called **conductors** (e.g., copper, aluminium).

2. **A) Insulators**
Explanation:
Insulators are materials that do not allow electric current to pass through them (e.g., rubber, plastic, wood).

3. **C) Our body is a bad conductor of electricity.**
Explanation:
The human body conducts electricity due to the presence of water and salts, so it is a **good conductor**, not a bad one.

4. **D) Iron Nail**
Explanation:
An **iron nail** is a metal and metals allow electric current to pass through them easily, so it is a **conductor**.

5. **B) Two**
Explanation:
An electric cell has **two terminals** — a **positive (+)** terminal and a **negative (–)** terminal.

6. **B) Material**
Explanation:
Resistivity is a property of the **material** of the wire. It does **not** depend on the length or cross-sectional area of the wire.

7. **C) Battery**
Explanation:
A **battery** is a combination of two or more electric cells connected together (usually in series) to provide higher voltage.

8. **A) Tungsten**
Explanation:

The filament of an electric bulb is made of **tungsten** because it has a **very high melting point** and can glow without melting when heated by electric current.

9. **C) Plastic**
Explanation:
Plastic is an **insulator** and does not allow electric current to pass through it, whereas copper, silver, and graphite are conductors.

10. **B) Circuit**
Explanation:
A **circuit** is a **closed and continuous path** through which electric current flows.

JEE ADVANCED LEVEL QUESTIONS

Multi correct Answer Type:

11. A) Wood and **D) Glass**
Explanation:
Insulators do not allow electric current to pass through them.

- **Wood** (dry) and **glass** are insulators.
- **Lead** (a metal) and **salt solution** conduct electricity.

12. **Correct Answer(s):**
A) Living plants, **B) Brass**, **C) Impure water**, and **D) Gold**
Explanation:
All the given options allow electric current to pass:

- **Living plants** contain water and salts → conduct electricity
- **Brass** and **gold** are metals → good conductors
- **Impure water** contains dissolved salts → conducts electricity

13. **Correct Answer(s):**
A) Leather, **B) Cork**, **C) Nylon**, and **D) Pure water**
Explanation:
All the given materials are **insulators**:

- **Leather, cork, and nylon** do not allow electric current to pass through them.
- **Pure (distilled) water** does not conduct electricity because it has no dissolved ions.

14. **A) Both A and R are true and R is the correct explanation for A.**
Explanation:
Metals allow electric current to pass through them easily, hence they are

conductors. The reason correctly explains the assertion.
15. D) A is false but R is true.
Explanation:

- The **assertion is false** because button cells are usually made of **zinc, silver oxide, lithium, or mercury compounds**, not nickel–cadmium.
- The **reason is true**: two or more cells together form a **battery**.

16. **C) a – 3, b – 4, c – 1, d – 2**
Explanation (Matching):

- Conductor → 3) Through which current passes easily
- Insulator → 4) Current does not pass at all
- Resistor → 1) Obstruct the flow of current
- Plug-key → 2) Used to close and open the circuit

17. The material which is **not an insulator** is a **conductor**.
Example Answer:
Copper (or any metal such as iron, aluminium)
Explanation:

- **Conductors** allow electric current to pass through them.
- **Insulators** do not allow electric current to pass through them. So, any **metal** is **not an insulator**.

18. D) Mercury
Explanation:
Among the given metals, **mercury** has the **highest electrical resistivity**, so it is the **least conductor of electricity** compared to silver, iron, and aluminium.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

1. **B) Chemical energy into electrical energy**
Explanation:
An electric cell converts **chemical energy stored inside it into electrical energy**, which is supplied to a circuit.

2. **A) Button cell**
Explanation:
Wrist watches commonly use a **button cell** because it is small in size and provides a steady supply of electrical energy.

3. **A) One direction**
Explanation:
Electric current from a **cell** flows in **one direction only**, from the **positive terminal to the negative terminal** through the external circuit.

4. **A) Do not conduct electricity**
Explanation:
Insulators are materials that **do not allow electric current to pass through them** under normal conditions.

5. **A) Wood**
Explanation:
Wood (when dry) is an **insulator** and does not allow electric current to pass through it, whereas **iron, carbon (graphite), and silver** are conductors.

6. **B) Outer electrons are loosely bound to the atom**
Explanation:
In metals, the **outer (valence) electrons are loosely bound** to the atoms. These free electrons can move easily through the metal, allowing it to **conduct electricity**.

8. **C) Copper**
Explanation:
Copper is a **conductor** because it allows electric current to pass through it easily, whereas **rubber, plastic, and wood** are insulators.

9. **D) Electric generator**
Explanation:
An **electric generator** is used to generate a **large amount of electricity**, especially in power stations.

10. **B) Low melting point**
Explanation:
A **fuse wire** is made of a material with a **low melting point** so that it melts quickly when excessive current flows, thereby **breaking the circuit and protecting electrical appliances**.

JEE MAINS LEVEL QUESTIONS

Multiple choice question type:
1.B) Filament
Explanation:
In an electric bulb diagram, pointer **'A'** usually indicates the **filament**, the thin wire inside the bulb that **glows when electric current passes through it**.

2. **D) Terminal**
Explanation:
In the standard diagram of an electric bulb:

- **Pointer A** indicates the **filament**
- **Pointer B** indicates the **terminal**, through which electric current enters and leaves the bulb

3. A) Switch
Explanation:
A **switch** is a simple device used to **break (open) or complete (close) an electric circuit**, thereby controlling the flow of electric current.

4. **C) Positive Terminal**
Explanation:
In the standard diagram of an **electric cell (battery)**, pointer **'A'** usually indicates the **positive terminal**, shown by the **longer line or raised cap**.

5. **Negative Terminal**
Explanation:
In a standard diagram of an **electric cell (battery)**:

- **Pointer A** → **Positive terminal** (raised cap / longer line)
- **Pointer B** → **Negative terminal** (flat base / shorter line)

6. A) Switch
Explanation:
A **switch** is the device used to **open (break)** or **close (complete)** an electric circuit, thereby controlling the flow of electric current.

7. **A) Open**
Explanation:
Electric current **will not flow in an open circuit** because the path is broken. Current flows only when the circuit is **closed**.

8. **The symbol of resistance is the zig-zag line (—///\—).**
Explanation:
In circuit diagrams, **resistance (resistor)** is represented by a **zig-zag line**.
So, **choose the option that shows a zig-zag line** as the symbol of resistance.
9. **A) Tightly bound to atoms**
Explanation:
In **insulators**, electrons are **tightly bound to their atoms** and cannot move freely. Therefore, electric current cannot flow through insulators.

10. **C) Silicon**
Explanation:
Silicon is a commonly used **semiconductor material** in electronics. It has controlled electrical conductivity, which makes it suitable for devices like **diodes, transistors, and integrated circuits**.

JEE ADVANCED LEVEL QUESTIONS

11. A) Both A and R are true and R is the correct explanation for A.
Explanation:
Conductors are coated with insulating materials (like plastic or rubber) because **insulators prevent the flow of electric current**, thus avoiding leakage and electric shocks

12. **A) Both A and R are true and R is the correct explanation for A.**
Explanation:
Car batteries store electrical energy and can be **recharged repeatedly**, so they are correctly called **accumulators**.

13. **D) a – 2, b – 1, c – 4, d – 3**
Explanation (Matching):

- a) Torch → 2) to get light
- b) Conductor → 1) copper
- c) Bad conductor → 4) Air
- d) Fan → 3) to get air

15.
A) Graphite
C) Salt solution
D) Mercury
Explanation:

- **Graphite** conducts electricity due to free electrons.
- **Salt solution** conducts electricity because of dissolved ions.
- **Mercury** is a metal and hence a conductor.
- **Alcohol** does **not** conduct electricity well, so it is **not** a conductor.

16. B) Silicon
Explanation:
Silicon allows electricity to pass **partially** under certain conditions, so it is a **semiconductor**.
Graphite, salt solution, and mercury are conductors.

17. **C) Wood**
Explanation:
Wood (dry) is an **insulator** and does not allow electric current to pass through it.
Living plants, brass, and gold conduct electricity.