Class : x ELECTRICITY

1. How is static electricity different from current electricity?

Ans. Static Electricity: It deals with the production of electric charges on a body by friction.

Current Electricity: It deals with the motion of charges from one point to another.

2. Tap water conducts electricity whereas distilled water does not. Why?

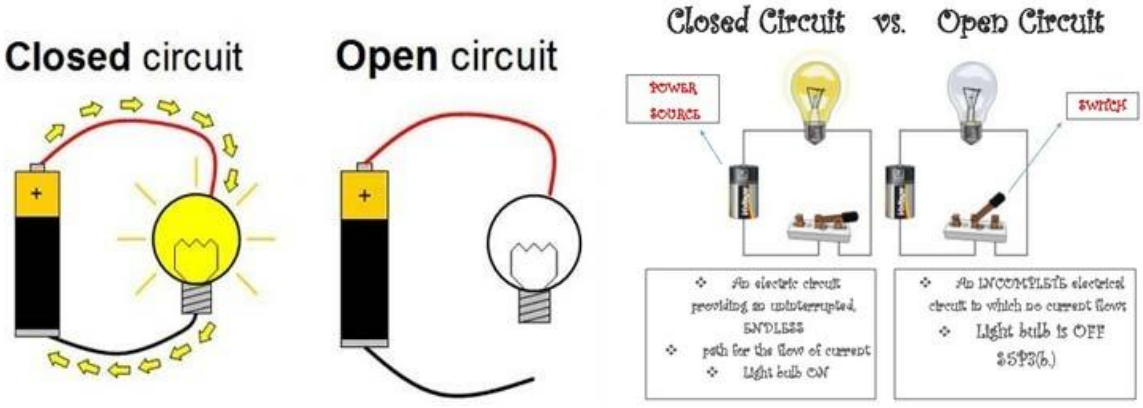
Ans. Tap water contains dissolved salts and minerals which ionize in water. Tap water conducts electricity due to the presence of these ions. Distilled water is a covalent compound containing very few ions and almost does not conducts electricity.

3. What is an electric circuit? Distinguish between an open and a closed circuit?

Ans. Electric circuit : A closed and continuous path along which an electric current flows is called an electric circuit.

In a circuit when the switch is closed current flows in the circuit and it is called a closed circuit.

In a circuit when the switch is open current doesn't flow and it is called an open circuit.

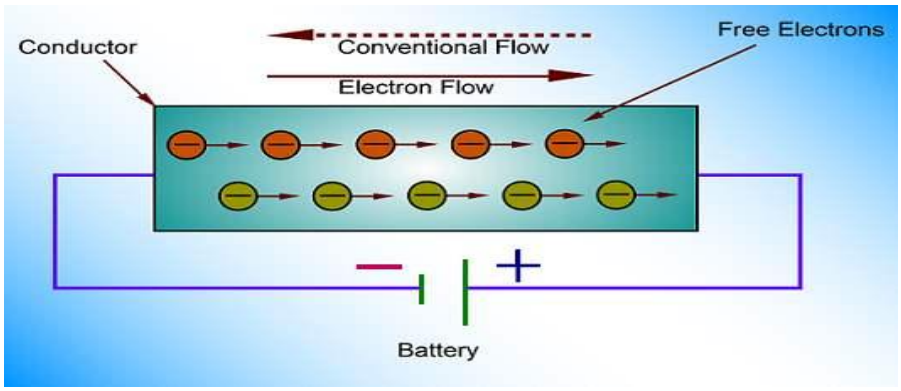


4. Distinguish between conventional current and electronic current.

Or

In an electric circuit state the relationship between the direction of conventional current and the direction of flow of electrons.

Ans. Conventional current and electronic current:



When the conductor is connected across the terminals of a cell, free electrons begin to drift or move from the end connected to the negative terminal of the cell to the end connected to the positive terminal of the cell. The current constituted by flowing electrons is called electronic current.

The direction of electronic current is from negative terminal to positive terminal.

By convention, the direction of motion of positive charge is taken as the direction of electric current. It is from positive terminal to negative terminal. As the electrons are negatively charged, the direction of conventional current in an electric circuit is taken as opposite to the direction of the flow of electrons.

5. Define electric current. What is its S.I. unit?

Ans. Electric current is defined as the rate of flow of electric charge through any section of a conductor.

Electric Current = $\frac{Charge}{Time}$; I = $\frac{q}{t}$; Ampere = $\frac{Coulomb}{Second}$

If a charge Q passes through a cross – section of a conductor in time t, then the current 'I' is given by $I = \frac{q}{t}$.

The S.I. unit of electric current is Ampere.

6. Define Ampere.

Ans. Electric current is sad to be one Ampere when one coulomb of charge flows for one second.

7. Define electric potential difference. What is its S.I. unit.

Ans. The potential difference between two points in an electric field is the amount of work done in driving a unit positive charge from one point to another point.

Potential difference = $\frac{Work}{Charge}$; $V = \frac{w}{q}$; Volt = $\frac{Joule}{soulomb}$

The S.I. unit of potential difference is Volt.

8. Define Volt.

Ans. The potential difference between two points is said to be one Volt when one coulomb of charge flows for one second. One coulomb of charge means 6×10^{18} electrons.

9. Calculate the number of electrons constituting one coulomb of charge.

Ans.

We know the charge on one electron is 1.6×10^{-19} C.

When charge is 1.6×10^{-19} C, number of electron = 1

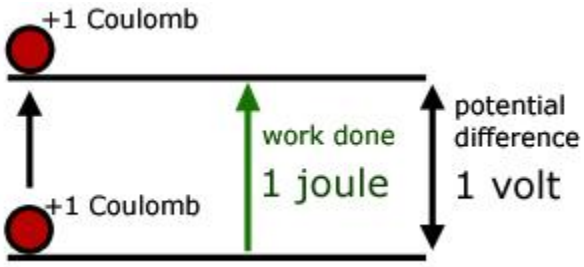
When charge is 1C, number of electron $= \frac{1}{1.6 \times 10^{-19}}$

$= \frac{10^{19}}{1.6}$

$= 6.25 \times 10^{18}$ electrons

10. State the relationship between 1 volt and 1 joule.

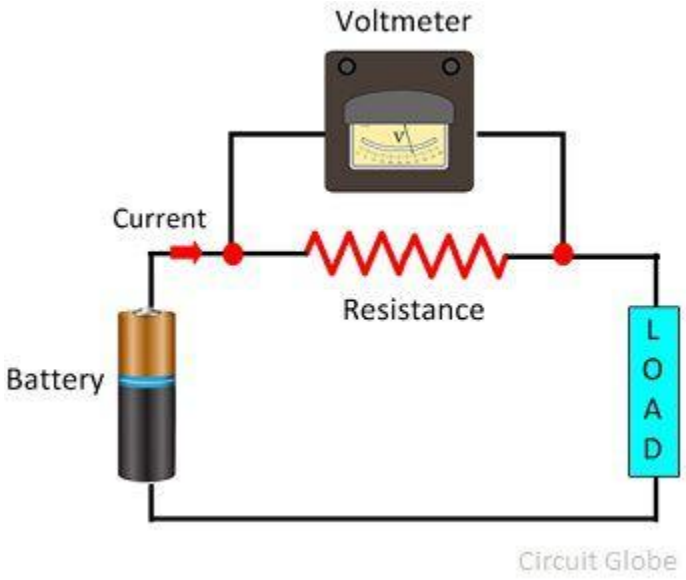
Ans.



$V = \frac{w}{q}$; Volt = $\frac{Joule}{soulomb}$

11. What is a voltmeter? How is it connected in a circuit?

Ans. A voltmeter is a device used to measure potential difference between two points in a circuit.

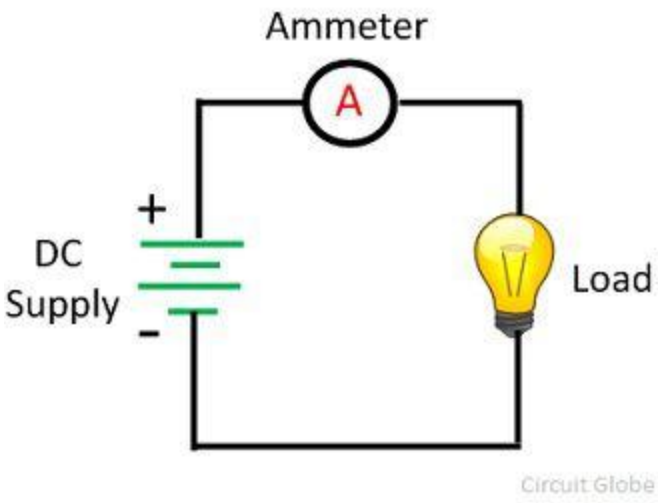


A voltmeter is always connected in parallel with the conductor at the ends of the load of which to measure the potential difference.

12.What is an ammeter? How is it connected in a circuit?

Ans. An ammeter is a electric device used to measure the number of charges flowing through the circuit.

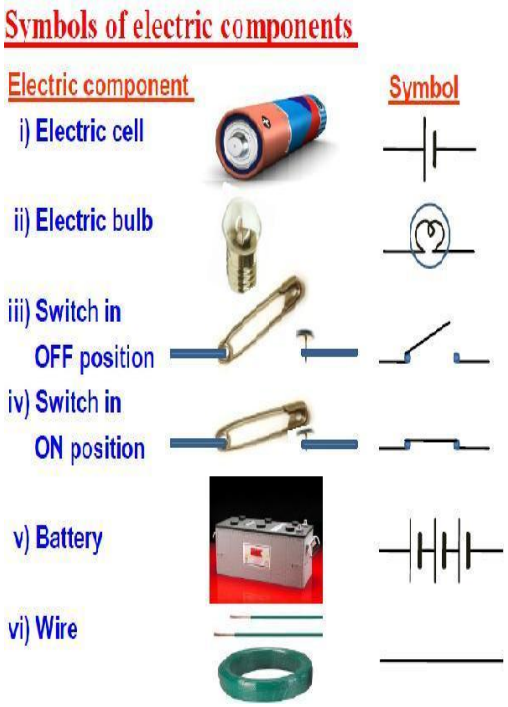
In a circuit it is always connected in series as to count all the charge flowing.



13. Give conventional symbols used for the various electrical components in the circuit diagrams.

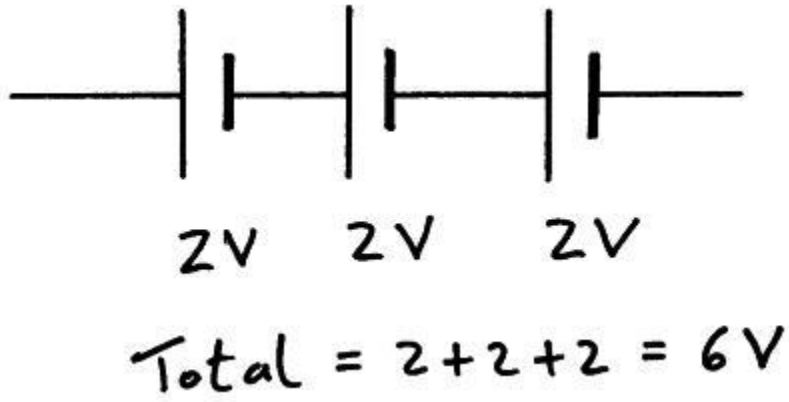
Ans.

S. No.	Components	Symbols
1	An electric cell	
2	A battery or a combination of cells	
3	Plug key or switch (open)	
4	Plug key or switch (closed)	
5	A wire joint	
6	Wires crossing without joining	
7	Electric bulb	or
8	A resistor of resistance *R*	
9	Variable resistance or rheostat	or
10	Ammeter	
11	Voltmeter	



14. What is a series connection of cells? How does the current and potential difference vary in a series connection?

Ans. Cells in series means end to end connection. In a series connection the negative terminal of the first cell is connected to the positive terminal of the second and the negative terminal of the second cell to the positive terminal of the third and so on.



In a series connection the same current flows through all the cells but the potential difference across the three cells is the sum of the potential differences across individual cell.

15. What is a parallel connection? How does the current and potential difference vary in a parallel circuit?

Ans. Cells in parallel connection means side to side .

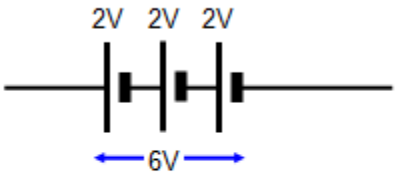


Figure 5

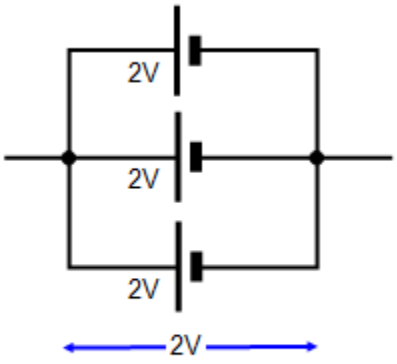


Figure 6

In a parallel connection the positive terminals of all the individual cells are connected to one point like a bunch and all the negative terminals of all the individual cells are connected to one point.

In a parallel connection the potential difference across the two points is the P.D. of any one individual cell or the highest P.D. and the current is the sum of the current flowing through individual cells.