EXERCISE-01

Multiple choice questions

1. Which of the following is true about two adjacent electric charges?
(1) If both are positive, they attract.
(2) If both are negative, they attract.
(3) If one is positive and one is negative, they attract.
(4) If one is positive and one is negative, they repel.

2. An electric charge is a
(1) kind of liquid
(2) property of matter
(3) kind of chemical reaction
(4) force acting at a distance

3. Which of the following is true regarding the interaction between a charged body and an uncharged body?
(1) They can repel each other.
(2) They can attract each other.
(3) There can be no attraction or repulsion between them.
(4) They sometimes repel, sometimes attract.

4. Two like charges
(1) repel each other
(2) first attract then repel
(3) first repel then attract
(4) attract each other

5. When few electrons are added to a body, the body is charged
(1) positive
(2) negative
(3) neutral
(4) The body may have positive or negative charge, depending upon how many electrons are added.

6. What constitutes current in metals?
(1) electrons
(2) atoms
(3) molecules
(4) protons

7. When a plastic scale is rubbed against dry hair, the plastic scale becomes
(1) positively charged by loosing electrons.
(2) neutral.
(3) negatively charged by loosing electrons.
(4) negatively charged by gaining electrons.

8. Which is not linked with 'static cling'?
(1) Frictional electricity
(2) Static electricity
(3) Current electricity
(4) All the above

9. Which of the following is a conductor?
(1) Glass
(2) Tungsten
(3) Wood
(4) Plastic

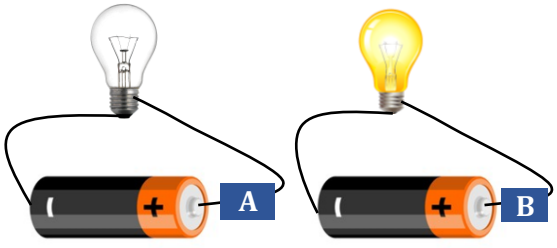
10. If we touch a bare (uncovered) current carrying wire, we get a shock. This happens because
(1) our body is an insulator of electricity
(2) our body is a source of electricity
(3) our body is a conductor of electricity
(4) transfer of electrons from one body to another takes place.

11. Which of the following is the best conductor of electricity?
(1) Ordinary water
(2) Sea water
(3) Distilled water
(4) Hot water

12. Which of the following cannot be used to make handle of a tool used for electrical repairing?
(1) Wood
(2) Plastic
(3) Glass
(4) Tin

13. Overhead cables used for transmission of electricity need not be insulated because
(1) air is a bad conductor of electricity.
(2) air is a good conductor of electricity.
(3) bare wires conduct electricity better than insulated wires.
(4) none of these

14. Look at the two electric circuits using materials A and B as shown below. What can you conclude from the circuits given below?



(1) A is an insulator, B is a conductor
(2) A is a conductor, B is an insulator
(3) Both A and B are insulators
(4) Both A and B are conductors

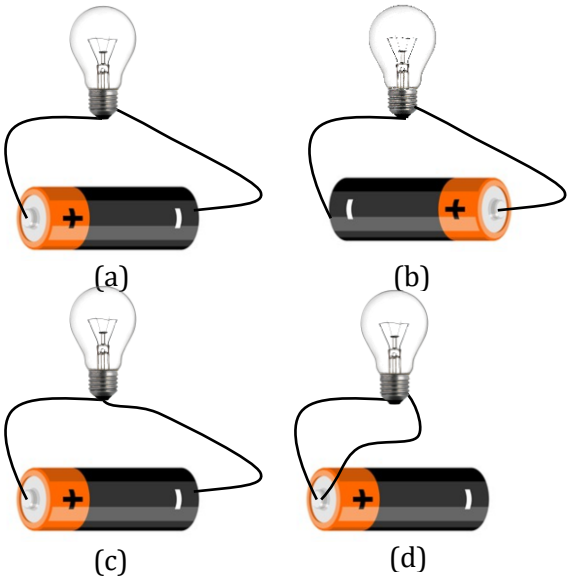
15. The best conductor of electricity is
(1) aluminium (2) iron
(3) copper (4) silver

16. The metallic cap provided at the one end of a dry cell is
(1) positive terminal
(2) negative terminal
(3) switch
(4) spring

17. Which term refers to the push that moves electrons through a circuit?
(1) Charge
(2) Current
(3) Resistance
(4) Voltage

18. Resistance in wires causes electrical energy to be converted into which form of energy?
(1) Chemical energy
(2) Nuclear energy
(3) Heat energy
(4) Sound energy

19. Select the figures in which the current will flow through the electric circuit?



(1) (a) and (d)
(2) (b) and (c)
(3) (a) and (b)
(4) (a), (b) and (d)

20. Which of the following does not provide voltage in a circuit?
(1) Wet cell
(2) Electric generator
(3) Wires
(4) Dry cell

21. What happens to a circuit when the switch is off?
(1) The circuit is complete.
(2) There is a gap in the circuit.
(3) Electricity flows continuously.
(4) Electricity flows for short duration.

22. If the two terminals of cell are connected directly with a wire, then
(1) more electric energy will be stored in the cell.
(2) no current will flow in the wire.
(3) the chemicals gets used up very fast.
(4) the current in the wire will be quite small.

23. When an object becomes positively charged, which of the following occurs in the object ? It
(1) Loses electrons
(2) Gains electrons
(3) Loses protons
(4) Gains neutrons

24. The electric current flows in wires due to
(1) flow of electrons
(2) flow of protons
(3) flow of neutrons
(4) vibration of atoms

25. Tungsten is used for the manufacturing of the filament of an electric bulb because
(1) it is a good conductor.
(2) it is economical.
(3) it is malleable.
(4) it has a very high melting point.

True or false

1. Electricity like heat and light is a form of energy.

2. When a glass rod is rubbed against silk, the glass rod becomes positive while silk becomes negative.

3. The process of charging a conductor from a charged body without touching them together is called induction.

4. When electrons are removed, the body is said to be negatively charged.

5. Electric current can flow through metals.

6. Electric current cannot pass through a sheet of thermocol.

7. The metallic electric wire can be replaced with plastic wire to allow flow of current.

8. Human body is an insulator of electricity.

9. The air gap surrounding an electric circuit act as an insulator.

10. A cell always have two terminals.

11. Instead of metal wires, a jute string can be used to make a circuit.

12. Electric current cannot flow through open circuit.

13. A switch is used only to prevent flow of current.

14. Electric current can flow through walls of a house.

15. A bulb is fused when its filament is broken.

1. Match the column

Column-I		Column-II	
(1)	Always attract each other	(a)	Negatively charged
(2)	Electrons are	(b)	Dry hair
(3)	Bad conductor of electricity	(c)	Like charges
(4)	Always repel each other	(d)	Unlike charges

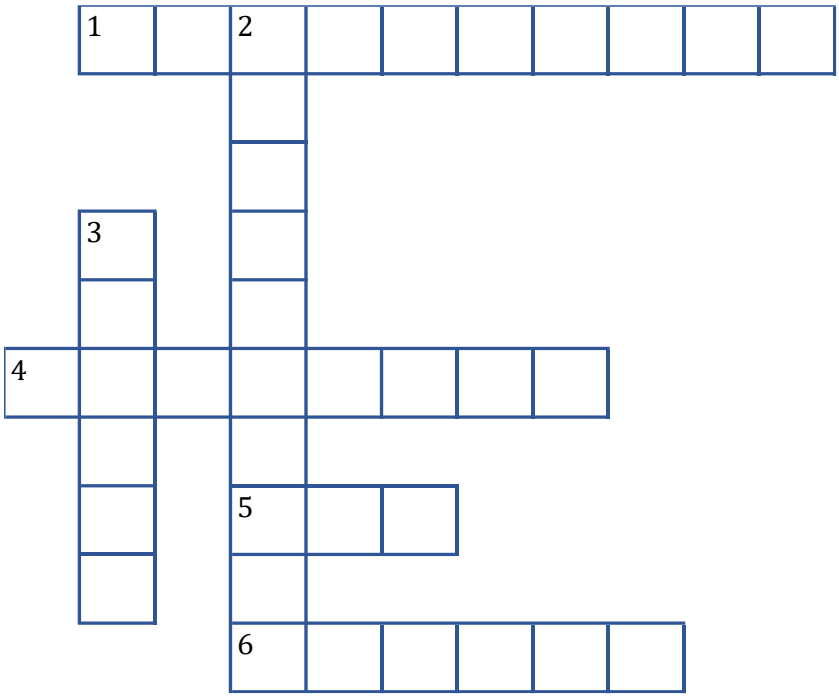
2. Match the column

Column-I		Column-II	
(1)	The path along which electric current flows	(a)	Electric circuit
(2)	A device which converts chemical energy into electric energy	(b)	Insulator
(3)	A material which does not allow the electric current pass through it	(c)	Cell
(4)	A material which allow the electric current to flow	(d)	Conductor

Fill in the blanks

1. An atom contains protons, neutrons and _____ .
2. Electric charge is a _____of matter.
3. Charging a balloon by rubbing it on wool is an example of _____.
4. An accumulation of electric charges on the surface of a material in rest condition is _____.
5. Air is not a conductor of electricity, it is an _____.
6. A _____ is a material that allows an electric charge to pass through it easily.
7. A _____ is a device that changes chemical energy to electrical energy.
8. An electric cell has _____ terminals.
9. The flow of electric charges is an _____ .
10. The electric force that makes current to flow in a circuit is related to the _____ .
11. The path along which electric current moves is an _____ .
12. Electric charge can only move through an electric circuit if it is _____ .
13. A device that is used to break an electric circuit is called _____ .
14. An electric circuit in which there is a gap is called an _____.
15. Electricity is the flow of _____.

Crossword



Across

1. Static electricity is also called_____ electricity.

4. In a torch bulb there is a thin wire that gives off light called a _____.

5. _____ is the unit of resistance.

6. Electric charge is a _____ quantity.

Down

2. In_____ electrons are tightly bound and they are not free to move.

3. A_____ is a device which turns electric current ON and OFF.

ANSWER KEY

Multiple choice questions

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sol.	3	2	2	1	2	1	4	3	2	3	2	4	1	1	4
Que.	16	17	18	19	20	21	22	23	24	25					
Sol.	1	4	3	3	3	2	3	1	1	4					

True or false

1. True **2.** True **3.** True **4.** False
5. True **6.** True **7.** False **8.** False
9. True **10.** True **11.** False **12.** True
13. False **14.** False **15.** True

Match the column

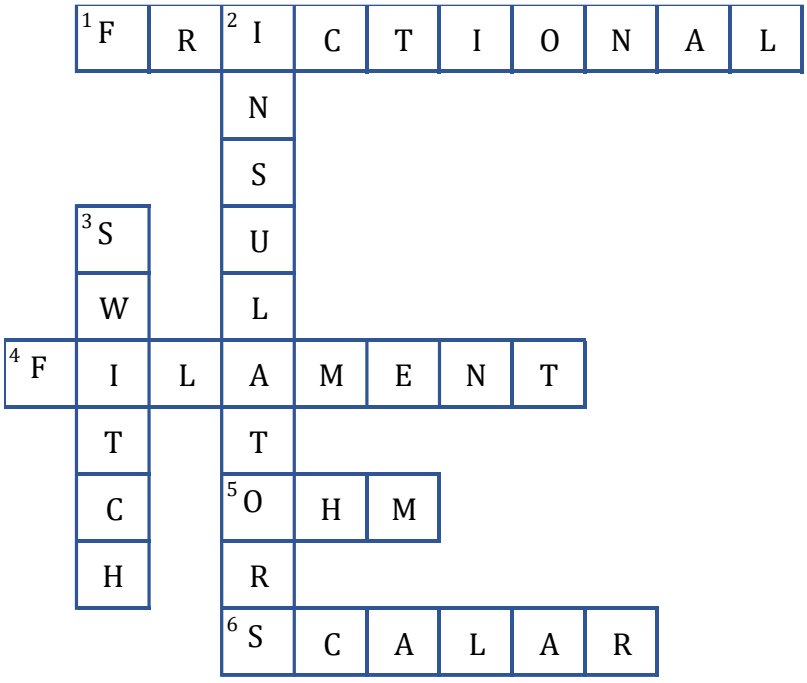
1. (1) → d ; (2) → a ; (3) → b ; (4) → c

2. (1) → a ; (2) →c ; (3) → b ; (4) → d

Fill in the blanks

1. Electrons **2.** Property **3.** Static electricity
4. Static electricity or Frictional electricity
5. Insulator **6.** Conductor **7.** Cell or Battery **8.** Two
9. Electric Current **10.** Voltage **11.** Electric Circuit **12.** Closed
13. a switch **14.** Open circuit **15.** Electric charges

Crossword



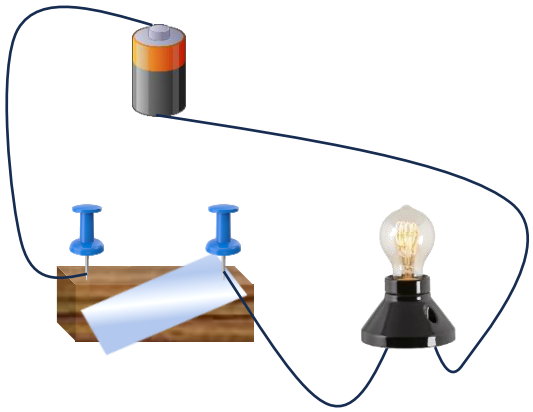
EXERCISE-02

Very short answer type questions

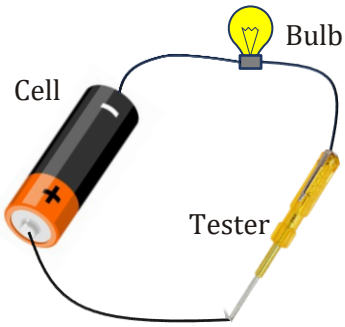
1. Define 'static electricity'.
2. What are conductors? Give two examples of conductors.
3. Which particle is responsible for flow of electric current through conductors like copper?
4. What are the two basic types of cells?
5. What is an electric circuit?
6. What is a switch?
7. Which type of material would you use for inner portion of connecting wire?
8. What is the direction of electric current in a circuit?
9. What are the two factors on which the amount of electric current that can flow through a circuit depends?
10. Draw a figure to show the parts of an electric bulb.

Short answer type questions

1. How does two unlike charges interact when they are kept near each other? What happens when a charged and an uncharged body are kept near each other?
2. How are conductors different from insulators?
3. Using the "conduction tester" on an object it was found that the bulb begins to glow. Is that object a conductor or an insulator? Explain.
4. Why should an electrician use rubber gloves while repairing an electric switch at your home? Explain.
5. The handles of the tools like screwdrivers and pliers used by the electricians for repair work usually have plastic or rubber covers on them. Can you explain why?
6. The diagram shows an electric circuit. The piece of foil acts like a switch. Would electric current flow through this circuit? Explain your answer.



7. Explain why the bulb would not glow in the arrangement shown in figure given below.



8. What is the purpose of using an electric switch? Name some electrical gadgets that have switches built into them.

9. What do you understand by closed circuit and open circuit? Make figures.

10. How can you make your own switch that can be used for performing experiments? Make figures.

Long answer type questions

1. What are the two kind of charged particles present in every matter? Explain, why a body is neutral, positive or negative on the basis of these charges.

2. Explain an activity that shows
(i) like charges repel each other
(ii) a charged body is attracted towards an uncharged body.

3. What are conductors and insulators ?
Give reasons for their behaviours. Also, write about their uses.

4. What do you understand by conventional current? Explain with the help of diagram.

5. Make the labelled figure of an electric torch. How does electric current move through a lighted torch?

EXERCISE-01 SOLUTIONS

Multiple choice questions

1. Option (3)

If one is positive and one is negative, they attract because like charges repel & unlike charges attract each other.

2. Option (2)

An electric charge is a property of matter. The electric charges are transferred by the gain or loss of electrons & electrons are present in the Atom of those materials which have free electrons and an atom is the building block of matter/materials. Even we are made of matter.

3. Option (2)

They can attract each other because, Unlike charges attract each other.

4. Option (1)

Repel each other because like charges repel each other.

5. Option (2)

Negative because electrons means negative charges & more electrons mean the body would be negatively charged.

6. Option (1)

Electrons because, Only the electrons are out of the nucleus & all other protons & neutrons are inside nucleus.

7. Option (4)

Negatively charged by gaining electrons Because it would gain electrons & more electrons means negatively charged.

8. Option (3)

Current electricity because in static cling the charges are at rest but in current electricity the electrons flows in side the conductor.

9. Option (2)

Tungsten as all the metals have free electrons to pass electric current.

10. Option (3)

Conductor of electricity because 70% of our body is made up of water & water is a conductor of electricity.

11. Option (2)

Sea water because, Sea water contains many mineral ores which help to conduct electricity.

12. Option (4)

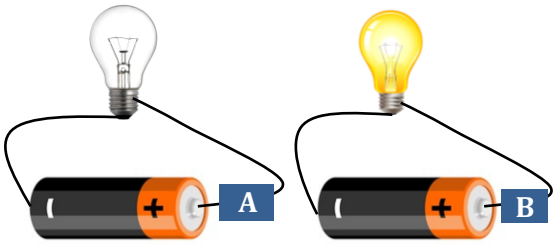
Tin because, tin is a metal & it is a conductor of electricity & by this we could get an electric shock.

13. Option (1)

Air is a bad conductor of electricity or its is an insulator.

14. **Option (1)**

A is and insulator, B is a conductor



As, electricity is not being flown by A So, it is an insulator & electricity is flowing through B easily so, it is a conductor.

15. **Option (4)**

Silver because, Silver has a large no. of free electrons.

16. **Option (1)**

Positive Terminal 

17. **Option (4)**

Voltage pushes electrons from negative to positive terminal of the cell.

18. **Option (3)**

Heat energy because High resistance results in the formation of heat energy, that's how a bulb glows.

19. **Option (3)**

because, arrangement in option (C) & (D) are incorrectly done. The bulb only glows when current enters from one terminal and exits from other terminal in a closed circuit.

20. **Option (3)**

Wires provide connecting path for the current in a circuit.

21. **Option (2)**

There is a gap in the circuit i.e. circuit becomes open.

22. **Option (3)**

The chemicals gets used up very fast as high current is flow in this conditions.

23. **Option (1)**

loses electrons because when an object loses electrons, it has more number of protons than electrons in it. Hence, it becomes positively charged.

24. **Option (1)**

Flow of electrons in the closed circuit.

25. **Option (4)**

it has a very high melting point as electric bulb works on the principle of heating effect of electric current.

True or false

1. **True**

because flow of electricity through high resistance results in heat & light energy.

2. **True**

as on rubbing, glass loses electrons and silk gains electrons.

3. **True**

4. **False**

Gaining of electrons makes a body negative and losing of electrons makes a body positive.

5. **True**

because metals are conductors.

6. **True**

because thermocol is an insulator.

7. **False**

Current cannot flow across plastic wires because, they do not have free electrons.

8. **False**

Electricity can pass through human body.

9. **True**

as air don't have free electrons.

10. **True**

one terminal is positive and other negative.

11. **False**

because jute is an insulator.

12. **True**

Because electric current requires conducting path to flow.

13. **False**

Because it is used to open or close the circuit

14. **False**

Walls are insulator so they do not have free electrons.

15. **True**

Because current cannot flow through a open circuit.

Match the column

1. (1 → d); (2 → a); (3 → b); (4 → c)

2. (1 → a); (2 → c); (3 → b); (4 → d)

Fill in the blanks

1. Electrons

2. Property

3. Static electricity

4. Frictional electricity or static electricity

5. Insulator

6. Conductor

7. Cell

8. Two

9. Electric current

10. Voltage

11. Electric circuit

12. Closed

13. a Switch

14. Open circuit

15. Electric charge

EXERCISE-02 SOLUTIONS

Very short answer type questions

1. The build up of electrical charges on rubbing of two objects is known as static electricity.

2. Conductors are materials that allow charges to flow through them easily.
Eg :- Copper, Silver etc.

3. Electrons are responsible for flow of electric current in conductors.

4. Two basic types of cells are dry cell & wet cell

5. An electric circuit is formed when an electric current passes through an unbroken path of conductors.

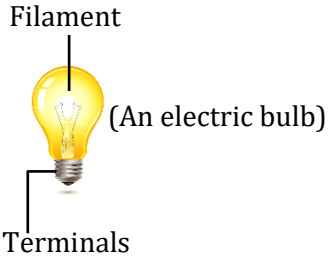
6. A switch is used to open or close an electric circuit.

7. We would use conducting materials like any metal.

8. Electric current is always said to flow from the positive terminal to the negative terminal of cell through electric circuit.

9. Two factors on which the amount of electric current that can flow through a circuit ae depends are :
(1) Voltage (2) Resistance

10.



Short answer type questions

1. When two unlike charges are kept near each other they attract each other. When a charged and an uncharged body are kept near each other they face an opposite nature, so they attract each other.

2. **Match the column**

Conductors		Insulators	
(1)	Materials that allow charges to flow through them easily	(a)	Materials that do not allow charges to flow through them easily.
(2)	They have free electrons	(b)	They do not have free electrons
(3)	Example : Silver, copper etc.	(c)	Example : Pure water, wood.

3. The object there is a conductor because the bulb begins to glow when tested in conduction tester. The current can only passed by conducting materials like metals etc.

4. An electrician should use rubber gloves while repairing and electric current or switch because rubber is an insulator of electricity which can keep him safe from electric shocks.

5. The handles of the tool like screwdrivers and pliers used by the electricians are usually have rubber or plastic cover on them because rubber or plastic are insulators or electricity which prevent them from getting an electric shock.

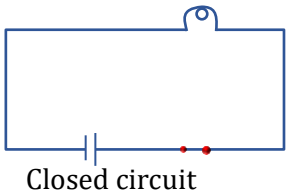
6. Yes, electric current will flow through this circuit because the foil is made up of aluminium which is a conductor of electricity.

7. An electric current cannot pass through objects such as plastic, rubber etc. because these objects are bad conductor of electricity from the given figure, it can be observed that one terminal of the bulb is connected to insulating holder of tester. No current will flow through the circuit. Hence, the bulb would not glow.

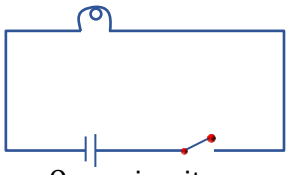
8. A switch is an electric device that is used to complete or break a electric circuit. If the switch is 'ON' then the a current can flow through the circuit. However, if the switch is 'OFF' then the current can't flow through circuit. 'TV', radio, fans, electric lamps are having switches built into them.

9. **Closed Circuit :-** A complete unbroken circuit is called a closed circuit through which electric current can flow.

Open Circuit :- The circuit having any opening is called an open circuit. No current flows in an open circuit.

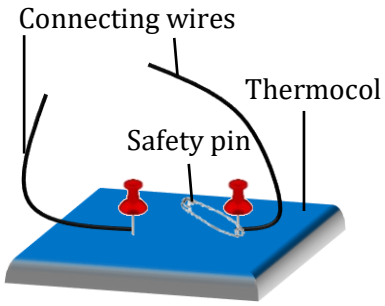


Closed circuit



Open circuit

10. (i) Take two drawing pins, a safety pin, two connecting wires and a small sheet of thermocol. Insert a drawing pin into the ring of the safety pin and fix it on the thermocol sheet [see figure (a)]. Make sure that the safety pin can be rotated freely.

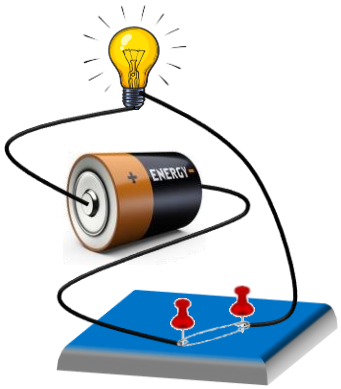


(a) Drawing pins

(a)

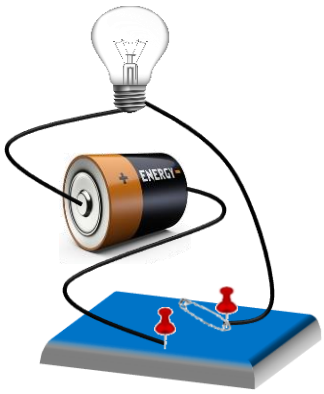
(ii) Now, fix the other drawing pin on the thermocol sheet in a way that the free end of the safety pin can touch it. This arrangement acts as a switch.

(iii) Now, make a circuit by connecting an electric cell and a bulb with this switch. Rotate the safety pin so that its free end touches the other drawing pin [see figure (b)]. The bulb glows in this case. The safety pin covers the gap between the drawing pins when you make it touch two of them. In this position the switch is said to be 'on'.



(b) Switch is 'on', bulb glows.

(iv) Now, move the safety pin away [see figure (c)]. The bulb stops glowing in this case. Here, the safety pin is not in touch with the other drawing pin. The circuit is not complete as there is a gap between the two drawing pins. In this position, the switch is said to be 'off'.



(c) Switch is 'off', bulb does not glow.

Long answer type questions

1. There are two types of charge particles present in a matter : positive and negative.

Atom contains particles called protons, neutrons and electrons. Neutrons have no electric charge, protons have positive electric charge and electrons have negative electric charge. A proton and an electron have equal magnitude of charge on them.

If an atom contains equal number of protons and electrons, the sum of positive and negative charges becomes zero and the atom has no net electric charge on it.

2. (i) (a) Inflate two balloons. Hang them in such a way that they do not touch each other.

(b) Rub both the balloons one by one with a woollen cloth. Now, release them, you will observe that the balloons repel each other.

Conclusion :- Since balloons are made up of same material (rubber) and they are rubbed against the same material. Both acquire negative charges. We observe that they begin to repel each other. This proves that like charges repel each other.

(ii) (a) Take an inflated balloon. Now, rub the inflated balloon with wool. Now, separate it from wool.

(b) Now, touch the balloon with a dry wall, it will stick for hours.

Conclusion :- When two bodies are rubbed against each other they get charged. Here the balloon get negatively charged and the wall is uncharged. Thus, we can say that charged object can get attracted towards an uncharged object.

3. The materials through which electric current can pass is known as conductor.

Behaviour :- They have free electrons, so they allow charges to pass.

Use - Metal Wires

The materials through which electric current do not pass is known as insulator.

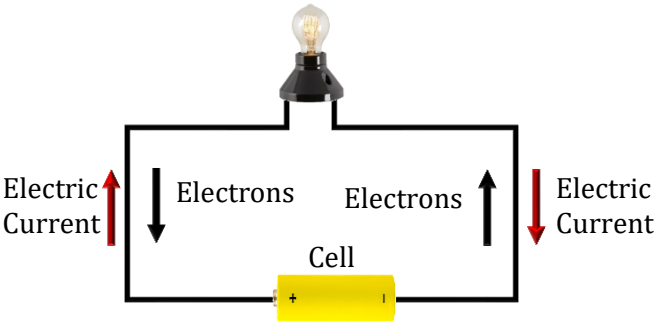
Behaviour :- They do not have free electrons so, they do not allow charges to pass.

Use - to cover conducting wires for safety purpose.

4. Electric current is always said to flow from the positive terminal to the negative terminal of cell in a circuit. This is called conventional current.

In a circuit, the movement of negatively charged electrons is from negative terminal to the positive terminal of cell.

Thus, we can say that the direction of movement of electrons is opposite to the direction of electric current.



5. There are two metal strips. Strip A is connected with the metal case of the bulb. Strip B is connected with the spring and strips C is a part of switch. While metal A and B are fixed, Strip C can be pressed and made to slide. When you press it, it touches strip A and B and the circuit unit is complete. This makes the bulb glow.