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Name. Science Sub. Scienee

Std. 7th Div. Roll No. 11,

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" Self-help is the best help "

Chapter-1

Exploring substances : Acid, Basic and Neutral

★ Acid

→ Change of chemical state is called acid.

Ex- Acetic acid, moliec acid, citric acid, lactic acid.

★ Acidic subtances

→ The word derived from latin word Acexe means sour stubtances that taste sour are called Acidic subtances

Ex- ① Vinegar ②Apple ③spinach ④Amla ⑤Lemon, orange, ⑥grapes ⑦curd

① Acetic acid
② Moliec acid
③ Oxalic acid
④ ascorbic acid
⑤ citric acid
⑥ Tartanic acid
⑦ lactic acid

★ Properties of acid :- Human are acid is presented as HCl Hydrochloric acid

PH = below 7

Non-ph value = Above 7

★ Uses of Acid :- Acid have many Important use -

* Hydrochloric acid is used to clean wash basin and other sanitary wares. It is also used at a Reagent In labourities.

* Sulphuric acid used to Automobile batteries and in Industries.

* Gold smith use mitric acid to clean Jewellery

★ Basic Subtances :- Bases are bitter in taste Due to present of bases in them

Ex- Washing soda shoap solution.

★ Some common bases:-

Common bases	Common Name	Mostly found in
1) Calcium hydraoxide	slaked lime	lime water
2) Sodium Hydraoxide / pottasium Hydraoxide	Caustic Soda	soap solution
3) Ammonium Hydraoxide	Ammonia water	window cleaner
4) Magnesium hydraoxide	milk of magnesia	Antacids

★ alkalies :- The bases which dissolve in water are called alkalies.

★ ~~flad~~ slacked lime :- Simple based used in science Laboratories Is lime water give calcium hydraoxide is called slacked lime.

Uses of bases

Bases are used in soap, textile, plastic many other Industries.

* Petrolium Rifining
* Cleaning Proccess
* an tacide
* Indicators : Acidic or bases nature of the substances a special kind of substance is called Indicators.

Types of Indicator

- Natural Indicator
- Synthetic Indicator

- Natural Indicator: Indicator that are obtained from naturally-occuring substances.

Ex- litmus, red, rose, turmeric etc.

- Synthetic Indicator: Synthetic Indicator are made in laboratories Phenolphthalein and menty Orange are most commonly used Synthetic Indicator.

- Nature: our science laboratory

=> Nature not only surrounds us with plant, animal, air and water, but also helps us learn

about the world in amazing ways. One fascinating example is how nature helps us identify weather a substance is acidic or basic. Some natural things - like

Ex- litmus from lichen, turmeric, red rose etc. act as natural indicators.

- Neutral solutions: In such as distilled water, litmus retains its natural purple colour

- Acidic solution: In blue litmus paper turns into red, whereas there is no change in colour of red litmus paper. It remains red.

- basic solution: In red litmus paper turns into blue. There is no change in colour of blue litmus paper. It remains blue.

Litmus as an acid-base Indicator

=> The most commonly used indicator in our sciece laboratory is the litmus paper.

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Exercise

★ Choose the correct answer:

1. Which one of the following types of madicines is used for treating indigestion?

=> Antacid

2. A solution turns red litmus blue, it is likely to be

=> basic

3. What happens when a solution of an acid is mixed with a solution of a base in a test tube?

=> (i) and (iv)

4. Turmeric is a natural indicator. On adding its paste to acid and base separately, which colours would be observed?

=> Yellow in acid and red in base

5) Acidic soil can be made fit for cultivation by treating it with

=> both a and b

6. The given picture show effect of Red rose indicator in acid, base and neutral solutions marked as X, Y and Z. Which of these solution could contain vinegar?

a) X

7. Consider the following reation: Acid + Basic $\longrightarrow$ X + Y

What does X and Y stand for?

a) X — salt; Y — water

8. Which option correctly matches the given columns?

a)	Tartaric acid	Tamarind
b)	Sodium hydroxide	Soap solution
c)	Litmus	Lichen
d)	Red rose	Natural Indicator
e)	Phenolphthalein	Sybthetic indicator

B. Fill in the blancks.

1. Slacked lime and quick lime are basic in nature

2. A yellow turmeric stain on a white cloth turns red when washed with soap.

3. Turmeric can be used as an indicator to test basic substances only.

4. Red colour of rose petal extract is due to the presence of anthocyanin, a water-soluble pigments.

5. Curd contains latic acid.

---

* State True or False. Also correct the false statements.

1. Rubbing baking soda between your plams given a soapy sensation. True

2. Odour of onion can be used to differentiate between acids and bases. True

3. Not only rose petals but petals of every flower can be used as an acid-base indicator. False

4. Lime water is prepared with demons. False

5. The salt formed by the neutralisation reaction is always basic in nature. False

★ Tick (✓) the odd-one out given reason

1. Methyl Orange, purple cabbage, Beet root, China rose.

2. Red rose, Turmeric, Beet root, clove oil.

3. Acid, Base, Salt, Lemon

4. Red colour, Blue colour, Purple colour, Yellow colour.

5. Milk of Magnesia, slacked lime, Quick lime, Organic matter.

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★ Short Questions and Answers.

1) It is advisable to given someone orange juice if he or she is suffering form indigestion issue due to activity?

Ans) Hydrocholoric Acid

2) Match the following in column I with that in column II:

A. Lemon drops + blue litmus paper

⇒ Red colour of litmus paper.

B. Soap solution + red litmus paper

⇒ Blue colour of litmus paper.

C. Tamaring extract + turmeric paper

⇒ Yellow colour of turmeric paper

d. Baking soda + turmeric paper

⇒ Red colour of turmeric paper

3) Disha takes 10 ml of three colourless liquids in separate test tubes. She adds 5 drops of red rose indicator to each test tube.

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a) Which test tube contains liquid soap?

⇒ Green

b) Why are red rose petals put in warm water to make the indicator?

⇒ Red

i) To Darken the colour of the petals

⇒ Darkened

ii) To keep the petals fresh for a long time

⇒ No change

iii) To distroy the germs present on the petals

⇒ Green

iv) To make the chemicals in the petals dissolve faster

⇒ Dark red

(c) Why did Disha add the same amount of indicator to the three test tubes?

Ans ⇒ No change

d) While making rose petals extract, which step must she follow during the activity to ensure safety?

Ans → (i) Tie hair (ii) Wear short sleeves

(e) Lime water is a base

- Is the statement true for lime water

i) Lime water is sour in taste. No

ii) Lime water is slippery to touch. Yes

iii) Lime water turns litmus paper blue. Yes

4. Why do you think acidic soil should be treated with slaked lime?

Ans → Because slacked lime is basic, it neutralizes acidic soil.

5. How will you check the nature of floor cleaning liquid using an indicator present at home?

Ans Use litmus paper:

- Turns red → acidic
- Turns blue → basic

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★ Long Answer type questions -

1) Give two points to differentiate between the following on the basic of points mentioned in the bracket :

(a) Acids and bases

⇒ It is not always possible to know the acid or bases nature of substances by tasting them. Tasting a substance in laboratory is not also advisable because it may be harmful. Thus, to test the chemical nature of the substances a specicial kind of substance called Indicator is used.

⇒ ① Acids like the change of chamical state is called Acids substances with sour taste.

⇒ ② Bases like substances that are bitter in taste and feel soapy.

(b) Red rose extract and turmeric.

Ans) ① Red Rose extract - It obtained from petal of the red rose flower contains natural oil, vitamins

• Turmeric - It comes from the root of the turmeric plant contains an active compound called curcumin, which gives it strong medicinal properties.

2) What are indicators? Mention the various types of indicators known to you.

Ans) It is not always possible to know the acid or bases nature of substance in laboratory them. Tasting a substance in laboratory is not also advisible because it may be harmfull. Thus, to test the chemical nature of the substances a special kind of substance called indicator is used.

3) What is alitmus? How it obtained? Design an experiment to identify acidic, basic and a neutral solution using litmus papers.

Ans)

Group A (Blue litmus to red)	Group B (Red litmus to Blue)	Group C (no change in colour)
The substances in Group A, such as lemon juice, amla juice, tamarind water, and vinegar turned the blue litmus paper to red, implying that these substances are acidic in nature	The substances in Group B, such as soap solution, baking soda solution, lime water, and washing powder solution turned the red litmus paper to blue. Hence, these substances are basic in nature.	The substances in Group C, such as tap water sugar solution, do not change the colour of either litmus paper. These substances are said to be neutral because they are either acidic or basic.

4. Give reason for the following:

(a) An antacids is given to get relief in indigestion.

Ans ⇒ Acidity, can be painful and causes pain or burning sensation in the stomach. To get rid of this, any antacid such as milk of magnesia (a base) is taken. Milk of magnesia, being a base (contains magnesium hydroxide) neutralises the effect of hydrochloric acid and gives relief from acidity.

(b) Baking soda paste is advised to rub on a bee string.

Ans ⇒ Baking soda paste neutralized the acidic venom of the bee string, which reduces pain, itching and swelling. When a bee strings, it injects an acidic venom. Baking soda is a base, so it helps neutralize the acid.

c) The toothpaste prevents tooth decay.

Ans ⇒ Tooth decay occurs when food particles, especially sugars, remain in the mouth. Bacteria present in the mouth act on these sugars and produce acids. These acids gradually attacks and damage the enamel, which is the hard outer layer of the teeth. If this process continues, it leads to cavities and tooth decay.

Toothpaste used to remove these particles.

5. What is neutralisation reaction? A solution A turns red litmus solution blue. You add another solution B to this solution so as to reverse the change. Can you guess A and B? Write the steps involved in the process.

Ans/ Neutralisation reaction: Reaction between an acid and a base resulting in a salt formation Acid + base → salt + water + heat. Solution A turns red litmus blue, so A is a base. To reverse the change you need an acid, so B is an acid. These step that involved process —

① Take solution A (base) → It turns red litmus ~~pat~~ blue.

2. Add solution B (acid) to it.

3. The acid neutralises the base.

4. The solution becomes neutral, and blue litmus may ~~be~~ turns back to red.

5. Salt and water are formed, and heat is released.

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"A man learns by his error"

chapter - 1

Electricity: Circuits and their components

★ Electricity

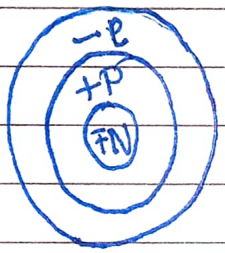
⇒ When two object is strongly Rubbed on get the both object is charged is called Electricity.

EX- Glowing bulb

★ Charge

⇒ It is a Intrisic property of matter is called charge.

Ex-



★ Types of charge :-

Charge be define As Two types of charge.

① Positive charge ② Negative charge

- Cooking:- Electric kettle, mixer grinder, toater, oven, microwave, induction ect.
- Lighting:- Homes, schools, offices, street, markets, factaries, mall, ect.
- Transportation:- Train, bus, car, scooter, lift, escalatar ect.
- Heating and cooling:- Fan, room heater, immersion road, geyser, refrigeratar, air conditioner, press ect.
- Entertainment:- Television, radio, laptops, computers ect.
- Communication:- Mobile phone, Internet eet.
- Others:- Water pump, corane ect.

* Generation of Electricity

Have you ever thought from where do we get electricity? In our previous class (Chapter: 'Nature's Treasures), we have studied that how by utilizing the energy from natural sources, electricity can be generated.

Ex-
- Generation of electricity thought windmills.
- Generation of electricity through solar panels.
- Generation of electricity through water turbines.

• Electric turbines.

★ A Torch Light

⇒ You might have used a torch light, also called a torch or a flashlight. It produces light and helps us to see during dark conditions. Is it actually the torch or some thing else that gives out light? Let's find out through Activity 1.

★ A simple Electrical Circuits

⇒ To Understand how a torch works, let us find out about its components.

• An electric cell.

⇒ An electric cell is a portable device which provides electricity, although very less as provided by the electric cable supply line (220 V of edectricity)

★ Battery

⇒ A combination of two or more cells connected together is called a battery is formed by conecting the positive terminal of one cell to the negative term of another.

* Electric Lamp

⇒ Electric lamps are available in the market as incandescent lamps or ordinary bulbs as commonly called, CFL and LED lamps.

* An Incandesecent lamp

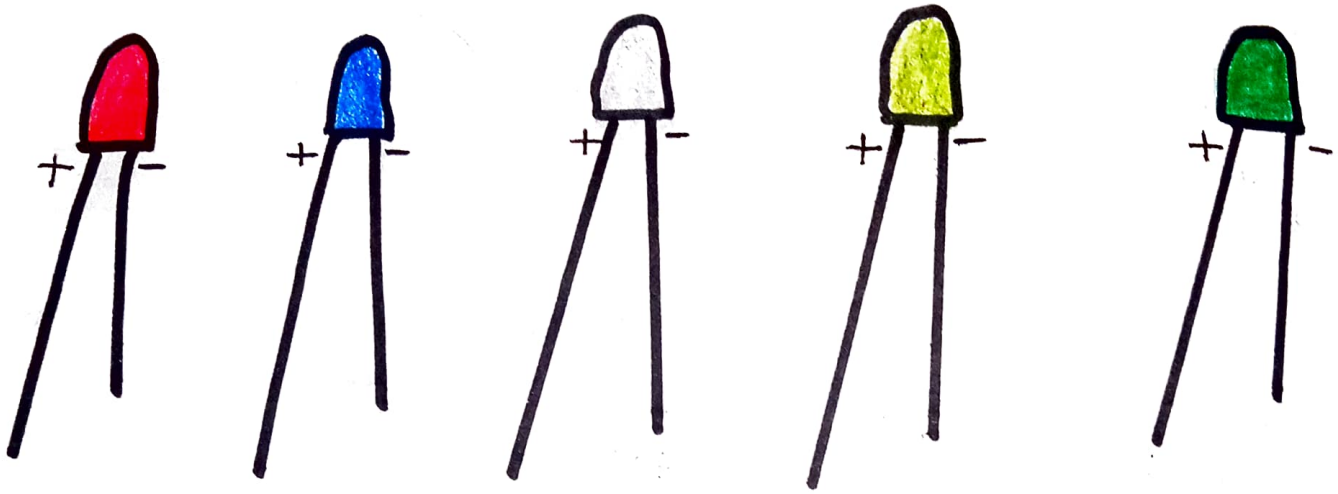
⇒ An Incandescent or electric bulb is ginerally used to light, torch, home ect. In the bulb, there is a thin wire called filament which glows, when an electric current passes throught it. This filament is made of tungsten.

* Alternate Types of Lamps

⇒ Many torches have different kind of lamps such as LED (Light Emitting Diode) and CFL (compact Fluorescent lamp / Light), attached in a manner that they cannot be taken out of the torch. Unlike the electric bulbs where ~~so~~ some ~~electric~~ part of the energy received by the bulb is used to warm it up and hence, some electricity is wasted (due to heating), CFLs and LEDs have highter efficieny for converting electricity into brightness and they save electricity too.

* LED Lamps or Light Emitting Diode.

⇒ The most commonly used lamps these day is LED.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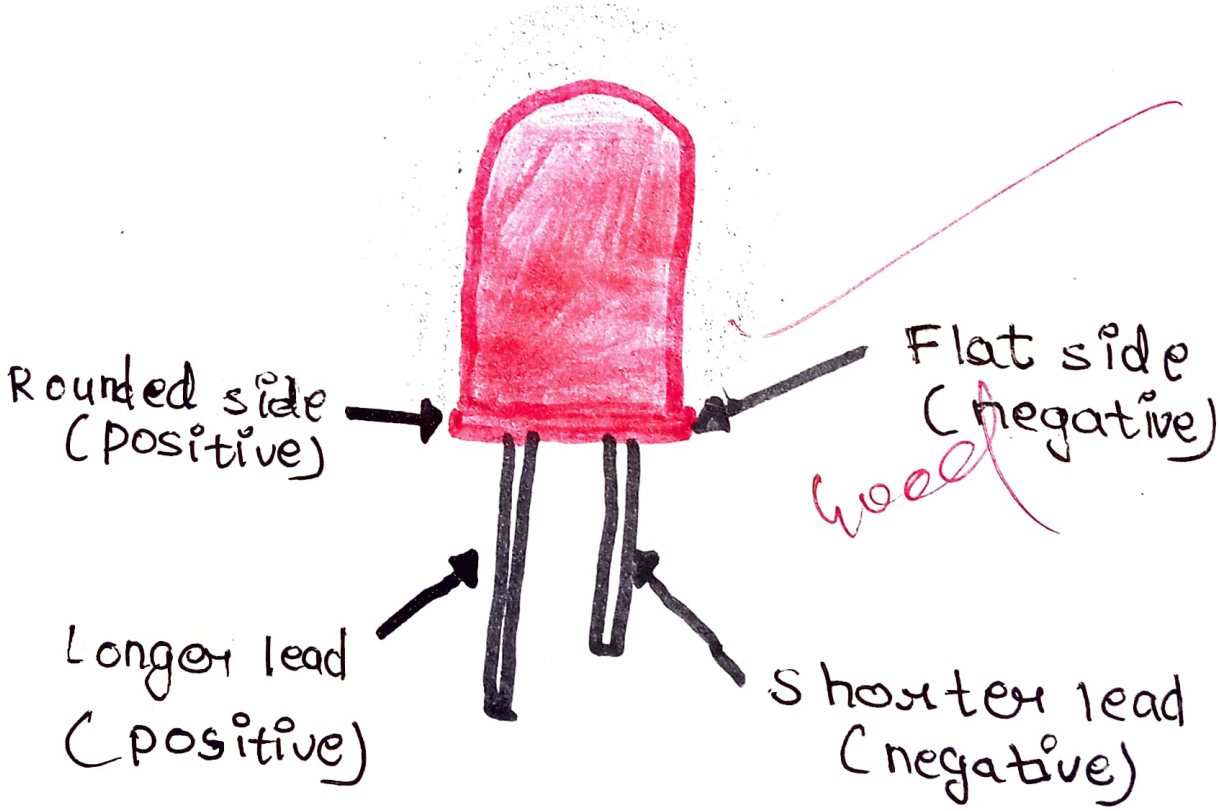
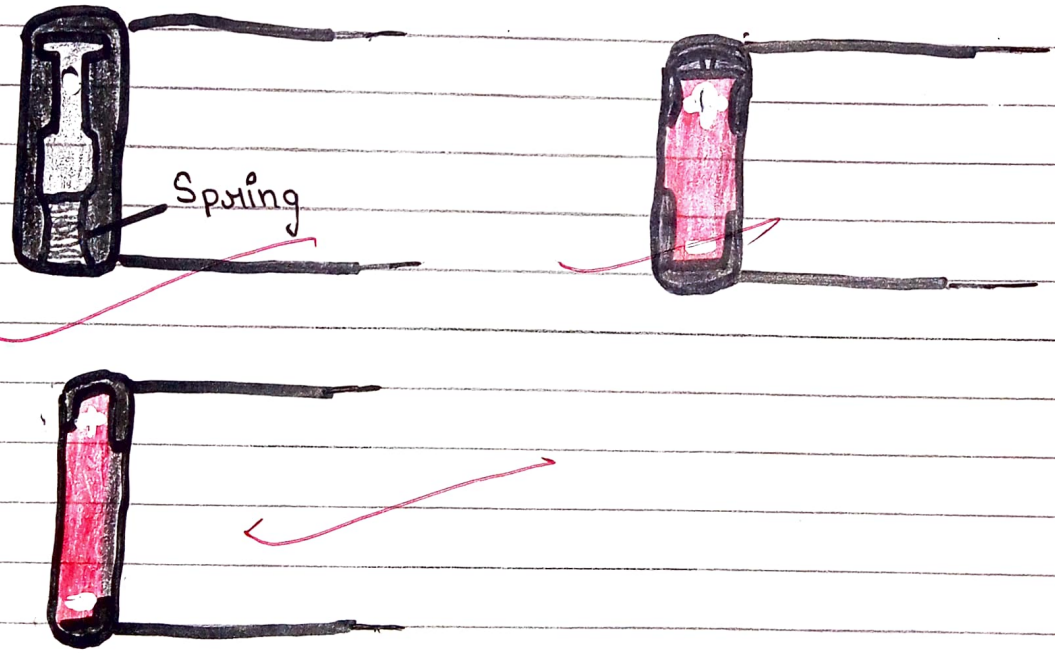
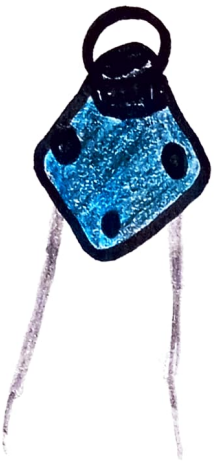

Rounded side
(Positive)
Flat side
(negative)
Longer lead
(positive)
Shorter lead
(negative)

LED is quite different from an incandescent lamps. It exits in many colours as you might have observed during Diwali Lighting.

★ CFLs or Compact Fluorescent Lamps.

⇒ In CFLs, light is generated using two electrodes. The fluorescent coating inside each tube makes the brighter. They reduce the wastage of electricity as the current is used only for light production but no heat.





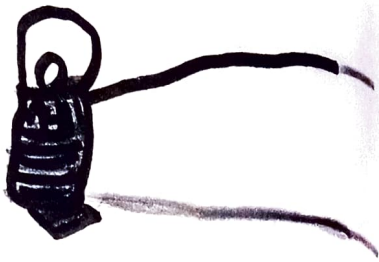


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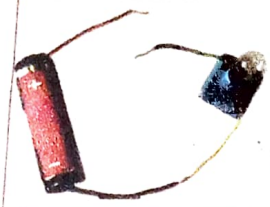
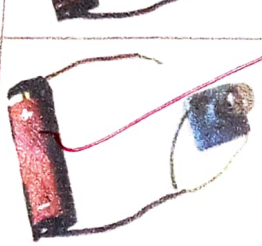
Table 1. Different ways of connecting a bulb to a cell to make it glow

S. No.	Arrangement of cell and lamp	Prediction	Observation
1.	 Both the wires from the cell are contacted with two terminals of the bulb	Bulb will glow	Bulb glows
2.	 One of the wires is contacted with positive terminal of the cell. The other wire is left free.	Bulb will not glow	Does not glow
3.	 One of the wires is contacted with the negative terminal of the cell. The other wire is left free.	Bulb will not glow	Does not glow
4.	 Both the wires from the bulb are contacted with the positive terminal of the cell.	Bulb will not glow	Does not glow
5.	 Both the wires from the bulb are contacted with the negative terminal of the cells.	Bulb will not glow	Does not glow
6.	 Both the wires from the cell are contacted with two terminals of the bulb by interchanging their positions.	Bulb will glow	Bulb glows

Observation : The lamp glows in the arrangements at S.No. 1 and 6 and does not glow in the remaining arrangements. Now, carefully look at the arrangements in which the lamp glows. Compare these with those in which the lamp does not glow.

Conclusion : In both S. No. 1 and 6 lamp glows only when the cell, the lamp and the wires form a complete path. We observe that all the wires allow the flow of current. In other arrangements, the flow is broken as wires are not connected.

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★ An Electrical Circuit

⇒ A continuous and closed path of an electric current is called an electric circuit.

★ Components of a circuit

⇒ The direction of electric current in an electrical circuits is taken to be from the positive to the negative terminal of the electric cell.

The basic components of a circuit include the following:

- Electricity souce : such as a cell or battery which has two terminals.
- Key / switch : Through ~~wich~~ which a circuit may be closed or opened.
- Connecting wires : made of good condutors to provide a path for flow of current.

A circuit can also contain other electrical components, such as bulbs, buzzers or monitors which allow electricity to pass through.

★ Closed and open circuits

⇒ The circuit in which electric current flow from one terminal of a battery to other is called a closed circuit. The circuit in which electrical contect at any point is broken, is called an open circuits. No current flows through an closed circuit. This may happens when the filament is broken. A broken filament stops the flow of current. Such a lamp is said to be fushed. There may be some other reasons for the lamp fails to gloco. The wires may be loosely connected or the cell is discharged.

★ Circuit Diagrams

⇒ A diagram which shows the arrangement of various components of electricity is an electric circuits with the help of their symbols is called a circuit diagrams. Sometimes, it is not possible to show all the components of circuits by drawing their pictures. So, we use symbols of electrical components to draw a circuit diagrams.

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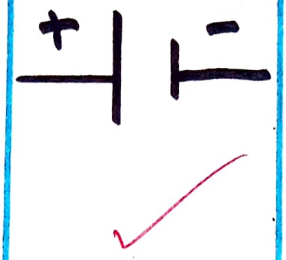
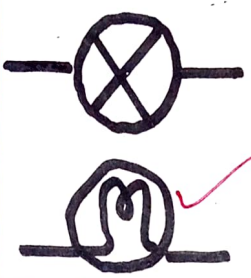
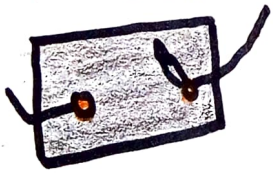
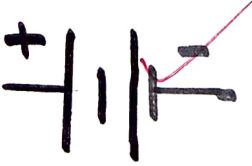
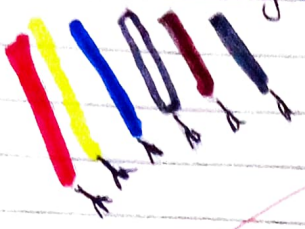
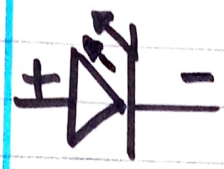
S.No.	Component	Symbol	Description
1.	Electric cell 		There is a thin longer line which is thick and short. Longer line represents positive terminal and shorter line represents negative terminal.
2.	Electric bulb 		It is represented by a circle having a cross or coiled structure inside representing filament.
	Switch (key)		
3.	Switch in ON position 		When the switch is in ON positive, current will flow.
	Switch in OFF positive 		When the switch is OFF positive, current will not flow.
5.	Battery 	 V. Good	It is a combination of two or more cells joined together. In its symbol, the positive terminal of one cell is joined to the negative terminal of the other cell.

5.	Connecting wires 	—	These are represented by drawing straight lines either horizontally or vertically. These wires are used to connect the components of the circuits.
6.	LED 		The triangle points to the direction in which the current can flow. The two arrow indicates that light is emitted by an LED.

- Key or switch can be placed anywhere in the circuit.
- When the switch is in the ON position, the circuit from the positive terminal of the battery to the negative terminal is complete. This is the closed circuit and the current flows thoughout the circuit instantly.
- When the switch is in the OFF position, the circuit is ~~important~~ incomplete. This is the open circuit, hence, no current flows through the circuit.

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★ Electrical Conductors And Insulators

→ Have you ever noticed metal wires used in electrical circuits are covered by a plastic material. Can you guess the reason? What if wires are just metals without the plastic coverings? Can we use some other materials other than metals for wires? Metals are, conductors.

★ Conductors

→ The materials through which electric current can flow easily are called good conductors.

- For making electrical wires, mainly copper is used due to its comparatively lower cost and abundant supply.
- Most of the electrical wires, switches, connectors of plugs, and sockets are made of conductors.

★ Insulators

→ The material though which current cannot pass through are called insulators.

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Exercises

★ Choose the correct answer.

1. In an electric cell, the current flow from

⇒ Positive to negative terminal

2. Out of the following, the element most suitable as conductor which supplies electricity at homes is

⇒ Silver

3. Which of the following situation/s best represent (s) a closed electric circuit:

i) electric current flows from one terminal of a battery to the other.

ii) Switch is in the ON position

iii) Switch is in the OFF position

iv) No gap in the circuit

⇒ (i), (ii) and (iv)

4. The bulb in the circuit shown in the figure does not glow.

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⇒ Terminals of cell are not properly placed

5. The electricity produced by utilising energy of flowing water is called

⇒ Hydro energy

6. Electric wires are covered with plastic because

⇒ Plastic is an insulator

7. The terminals of the bulb in the given figure are indicated by

⇒ C and D

8. Which option correctly matches the given columns?

a) Switch	Safety pin
b) Electric cell	portable source of electricity
c) LED	Conserves energy
d) Closed electric circuit	flow of current
e) Circuit diagram	symbolic presentation of electrical components

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★ Fill in the blanks.

1. An electric cell supplies current in a circuit.
2. Our body is a conductor of electricity.
3. In a closed electric circuit, current flow from one terminal of the electric cell to the other.
4. The filament of a bulb has high melting point.
5. In an LED, the positive terminal of the lamp connects to a longer lenght of wire.

★ State True or False

1. The symbols  represents an electric cell. False
2. On switching ON, the tubelight and CFLs become warm. False
3. When the circuit is open, the current doesn't flow. True
4. The negative terminal of an electric cell is towards the spring side of the holder of the torch. True

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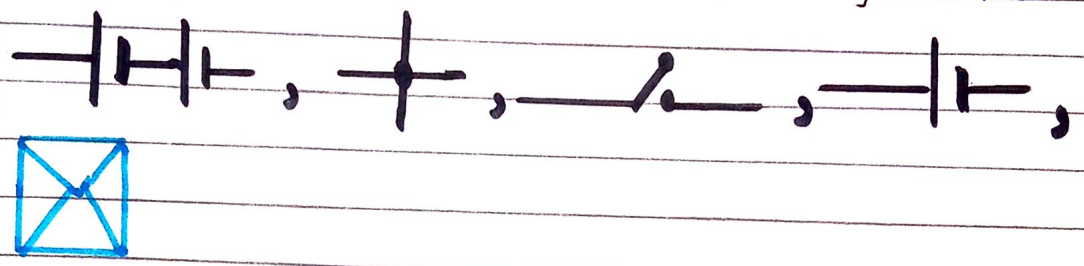
5. The current passes through the LED only when the positive terminal of the LED is connected to the positive terminal of the battery. True

★ Tick (✓) the odd-one out giving reason.

1. Open electric circuit, Circuit diagram, Battery, Closed electric circuit, Switch

2. 

3. Torch, Clock, TV remote, Mobile phone

4. LED, CFL, Tube light, Incandescent bulb

5. Eraser, Chalk, Glass, Bottle, Copper

★ Assertion – Reason

1. Assertion : Electric current is in flow of electric charge in a circuit.

2. Reason : In the circuit, electricity flows from positive to negative terminal.

⇒ Both Assertion and true but Reason is not the

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correct explanation of the Assertion.

2. Assertion: The circuit in which electrical contact is broken at any point is called an open circuit.

• Reason: In a open circuit, current can flow through its various components.

Ans) Assertion is true but Reason is false.

3. Assertion: The handless of screwdriver or testers used by electricians are usually made of wood or plastics.

• Reason: Insulators do not allow electricity to pass through them.

Ans) Both assertion and Reason are true and Reason is the correct explanation of the Assertion.

4. Assertion: Current can flow in any direction in the LED bulbs.

• Reason: In LED bulbs, the positive terminal is connect to the positive termnal of the battery and negative terminal is connected to the negative terminal of the battery.

Ans) Assertion is false but Reason is true.

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5. Assertion: A Incandescent lamp may not glow even when connected to cell.

- Reason: Bulb doesn't glow when either filament is broken or circuits is at fault.

Ans) Both Assertion and Reason are true and Reason is the correct explanation of the Assertion.

★ Short Answer type Questions.

1. When does a bulb glow in a circuit?

Ans) When current passes through the bulb's filament, it gets heated and emits light — this is why the bulb glows.

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2. How can we determine the positive and negative terminal of an LED?

Ans) ★ Length of the legs

- The longer leg is the positive terminal.
- The shorter leg is the negative terminal.

★ Flat side on the LED body

- Look at the plastic casting of the LED.
- The side withe a flat edge indicates the

negative terminal.

* Using a battery

- Connect the LED to a small battery:
- If it glows, the connection is correct.
- If is does not glow, reverse the connections.

3. Does a closed circuit has switch is ON position or OFF position?

Ans) • When the switch is ON: The circuit is complete, Electric current can flow and Devices like a bulb will glow.

• When the switch is OFF: The circuit is broken, No current flows and The bulb will not glow.

Closed circuit → switch ON
Open circuit → switch OFF

4. A fused lamp does not glow. why?

Ans) Due to the break, the circuit becomes open, so no current flows through the lamp.

5. Think of you activities which use electric current. Also name to devices used to perform the activity.

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Ans). Studing at night → Electric bulb / LED lamp

- Watching TV → Television
- Charging phone → Mobile charger
- Heating food → Microwave / Electric stove
- Washing clothes → Washing machine.

6. In which of the following situation a lamp will glow ?

a) Lamp is connected via one wire to one of the terminals of the electric cell. NO

b) Lamp is connected via two wires to only one terminal of the electric cell. NO

c) Lamp is connected via its two wires, one going to one terminal; second going to another terminal of the electric cell. Yes

d) No wire from lamp is connected to any of the terminals of the electric cell. No

7. What makes the human body to conduct electricity?

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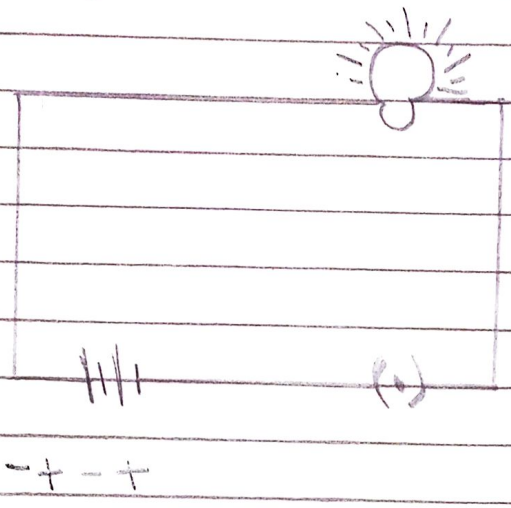
Ans ~~Yes~~ The Human body Always charged to nagetive electron.

★ LONG Questions and Answers.

1) Draw an electric circuit with an electric cell, a bulb and a switch in ON position?



Frist of All we get the electric wire and get the shape electric diagrame in clude As

→ Battery
→ Switch — on
→ electric — off

Battery Terminal (positive and negative) positive terminal connected positive ~~positive~~. position. Negative position in a Electric wire which in due electric switches (on/off) position to glow the, electric bulb.

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2) What is the role of an electric switch in a circuit? What kind of materials are used for making the body casing of electric switches?

Ans switches is an outer structure that allows current to puss by compodetings electric circuit.

Material Required

To Drawing pins (a safftey pin or a paper) clip two wire and a small peice of card-board.

Q3) You are given six materials : a tumbler made of steel, a note book, a wooden scale a key, a sopper wire, a handkerchief Resigh an experiment wing these six object to indentify insulators from conductors?

Ans A Tumbler made of ~~wo~~steel

The current is pass in steel is a good conductor of electricity its conductor

A Notebook

The current is not flow a note books is electricity & the bored conductor of electrikity

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Its Insulator.

A wooden scale

Current not flow Its a bad conductor of Eelectricity.

A key

Its called conductor

a copper

Current pass cash war to a Electricity It is good conductor of electricity.