

*Mehran Series*

# **MAYARI SCIENCE**

For Class Eight

## **TEACHERS GUIDE**

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## EXERCISE

**A: ANSWER THE FOLLOWING QUESTIONS:**

Q1: Define the following terms:

- (1) Sensitivity
- (2) Stimulus
- (3) Response
- (4) Receptors

Ans: (1) Sensitivity:

Living organisms can feel the changes which take place in their surroundings. They have the ability to sense and respond to these changes. This ability of living things is called sensitivity.

## (2) Stimulus:

The information or thing which is sensed and felt by sensory organs and brain about an action is called stimulus.

### (3) Response:

The action of a body which takes place also due to stimulus is called response.

#### (4) Receptors:

Animals have sensory organs provided with special cells called receptors which detect these changes.

The sensory organ like ears have receptor for sound, eyes have receptor for light, nose have receptor for smell and mouth has receptor for taste

**Q2:** Describe the structure and function of outer layer of human eye.

Ans: The outer layer is called the sclera. It is whitish in colour. It Protects the delicate

inner structure of eye. This layer bulges out in front of the eye ball to form a thin and transparent structure known as the cornea.

Q3: Describe the structure of middle layer of human eye.

Ans: The middle layer of the eye ball is black in colour and has a rich supply of blood. It is called the choroid. Behind the cornea, the free edge of the choroid forms a coloured area of the eyeball is called the Iris. It is differently coloured in different people. The central hole of the iris is called the pupil. Just behind the pupil is a lens which is transparent and biconvex in shape.

**Q4:** Describe the structure of inner most layer of human eye.

Ans: The inner most layer of the eyeball is called the retina. It is sensitive to light and act. Like a screen. The retina is made up of two types of sensory cells Rods and Cones. The region of the retina is located at the back of the lens is known as yellow spot. It is the most sensitive of the retina. Just below this region is a blind spot which is completely insensitive to light. The space between the lens and cornea is filled with a watery liquid known as aqueous humour. The space between the retina and lens is filled with a jelly like substance called vitreous humour.

Q5: What do you mean by long sightedness?

Ans: **Long Sightedness:**

If a person can not see near objects clearly but can see distant objects clearly he is said to be suffering from long sightedness.

Q6: What do you mean by short sightedness?

Ans: **Short Sightedness:**

If a person can not see distant objects but can see near objects clearly he is suffering from a defect is called short sightedness.

Q7: Why do some people colour blind?

Ans: The colour blind person is unable to distinguish clearly between two or more colour (red, green) because of some defect in the cell of the retina.

Q8: Describe the structure of outer ear?

Ans: **Structure of outer ear:**

The outer ear consists of pinna and a long narrow canal. The pinna is present only in mammals. It is flexible structure and uses to collect sound waves. The outer ear is connected to the middle ear by a narrow canal.

Q9: Describe the structure of middle ear?

Ans: **Structure of middle ear:**

The middle ear is an oval chambers filled with air. It has a thick membranous structure called the ear drum. Inside the chamber of the middle ear there are three small bones called hammer, anvil and stirrup. These three bones are connected to one another. The hammer is place close to

the eardrum and the stirrup is place against the small oval window which opens into the inner ear.

Q10: Describe the structure of inner ear?

Ans: **Structure of inner ear:**

The inner ear consists of a cavity which contains fluid. It also has a coiled shaped structure called the cochlea. The cochlea is a hearing organ. It is a hallow tube filled with fluid. The cells living the inner surface of the cochlea are sensory cells connected to a nerve called auditory nerve which enters brain. The inner ear also contains three half circle tube at right angle to each other. They are filled with liquid and enable us to keep our balanced. These are known as semi-circular canals.

Q11: How do we hear sound?

Ans: Sound waves entering the outer ear strike the eardrum which is placed in the middle ear. These waves cause the eardrum to vibrate. The vibrations are passed to the inner ear through the three small bones of the middle ear. The movement of the bones in turn cause vibration in the fluid of the cochlea which stimulates the receptors. Impulses are then sent to the brain through the auditory nerve. The brain interprets and translates the message and thus we recognize a sound.

Q12: What are the functions of human skin?

Ans: **FUNCTIONS OF HUMAN SKIN:**

The skin perform the following functions:

- (1) It protects our body.
- (2) It stores food in the form of fats.
- (3) It regulates temperature as well as acting as a sense organ.
- (4) It contains sensory cells which are sensitive to temperature, pressure, touch as pain.

**Q13:** How many layer are there of human skin?

**Ans:** **LAYERS OF HUMAN SKIN:**

Human skin is formed of three layers:

- (1) Outer layer
- (2) Middle layer
- (3) Inner layer

**Q14:** Write down the functions of tongue?

**Ans:** **FUNCTIONS OF TONGUE:**

There are only four basic tastes, sweet, bitter, sour and salty. Other tastes are the combinations of these taste.

There are four sections of the tongue which have different taste buds.

1. The tip of the tongue is very sensitive to sweet taste.
2. The front sides of the tongue are sensitive for salty taste.
3. The back sides of the tongue are sensitive for sour taste.
4. The taste buds at the back of the tongue are sensitive for bitter taste.

**Q15:** Describe the structure and functions of nose.

**Ans:** **Structure of Nose:**

The external openings of the nose are called nostrils which lead into the nasal cavity has

a living of nerve cells. When these nerve cells come in contract with an odour, they pass the message to the brain through a nerve known as cells. The brain interprets the message and thus we recognize the odour as pleasant or unpleasant.

**FUNCTIONS OF NOSE:**

When we want to smell substance we take a keep breath several times in quick succession. The air goes into a upper cavity of the nose. The odour particles touch the olfactory nerve ending and we smell the substance. Sometimes when we have cold, we cannot smell because the membrane of the nasal cavity becomes swollen and prevents the entrance of the air into the upper nasal cavities.

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. Eyes have receptor organs of sight.
2. Eyes are the sense organs of sight.
3. The transparent structure of sclera is called cornea.
4. The retina is made up of two types of light.
5. A blind spot is completely insensitive to light.
6. Pinna is used to collect sound waves.
7. Sensory cells connected to a nerve called sensory nerve.
8. Outer layer of skin is called epidermis.
9. The surface of tongue has sensory cells called taste buds.
10. The tip of the tongue is very sensitive to sweet taste.

C: CHOOSE THE CORRECT WORDS:

1. \_\_\_\_\_ layer of skin serves to protect other layers.  
(a) Dermis      (b) Epidermis ✓  
(c) Hypodermis
2. The inner ear also contains \_\_\_\_\_ which unable use to keep our balance.  
(a) Auditory nerve    (b) Cochlea  
(c) Semi-circular canal ✓
3. The front side of the tongue is sensitive to \_\_\_\_\_ taste.  
(a) Sweet      (b) Bitter      (c) Salty ✓
4. \_\_\_\_\_ is the most sensitive region of the retina.  
(a) Yellow spot ✓    (b) Blind spot  
(c) Cones
5. Eardrum present in the \_\_\_\_\_ ear.  
(a) Outer      (b) Middle ✓      (c) Inner

CHAPTER-2

**NERVOUS SYSTEM  
EXERCISE**

A: ANSWER THE FOLLOWING QUESTIONS:

Q1: What do you mean by nervous system?

Ans: Nervous System:

Communications between stimulus and response take place due to the nervous system present in our body. The nervous system of man consists of a brain, spinal cord and nerves associated with brain and spinal cord.

Q2: Write down the functions of the followings:

(1) Fore brain (2) Mid brain (3) Hind brain.

Ans: (1) Functions of fore brain:

The forebrain does most of the thinking and co-ordinates activities of the body. It is also called the net work of intelligence.

(2) Functions of mid brain:

This part of brain performs the balancing functions of the body. It controls the voluntary actions for examples we can take our finger correctly towards our nose.

(3) Functions of hind brain:

It contains the centres of the nerves group which controls the rate of breathing the pumping of heart and circulation of blood and digestive system.

Q3: Write down the function of the spinal cord.

Ans: Functions of the Spinal Cord:

(1) It receives unapses from different organs through nerves and sends then to the brain.

(2) It also controls the non-voluntary (reflex actions) functions.  
(3) Spinal cord gives off 31 pairs of spinal nerves which form a complex network in the body.

**Q4:** What is Co-ordination?

**Ans:** It is that phenomenon in which different activities of the different organs and the entire organism are regulated in an organized manner. In nervous system the brain and the spinal cord act as co-ordinators.

**Q5:** What do you mean by voluntary and involuntary action?

**Ans:** **Voluntary Actions:**

The actions which involve the thinking part of the brain are called voluntary actions. Walking, talking, singing and playing are the examples of voluntary actions.

**Involuntary actions:**

Such actions which do not involve any thinking part of brain are called involuntary actions. Body actions such as heart beat, respiration, digestion and excretion are the examples of involuntary actions.

**Q6:** What is reflex Action? Name the parts which are involved in reflex Action.

**Ans:** **Reflex action:**

The action takes place without involving the brain. This is a kind of non- involving action which is called reflex action.

Parts involved in reflex action:

For the performance of reflex action the parts are involved given below:

- (1) Receptors (any part of the body)
- (2) Sensory Nerves
- (3) Motor Nerves
- (4) Brain or spinal cord
- (5) Effectors (Muscles or Glands)

**Q7:** How does reflex action occur?

**Ans:** Reflex action occurs due to the involuntary actions.

**Q8:** What are receptors, neurons and effectors?

**Ans:** These are the organs which receive external stimuli and transmit to the brain or spinal cord.

**Neurons:**

A neuron is a single nervous cell which has cell body and a nucleus.

**Effectors:**

These are the organs which give response on receiving the orders from the nervous system. Effectors exit in the form of glands and muscles.

**Q9:** Describe the types of neurons?

**Ans:** **Types of Neuron:**

There are two types of neuron:

**(1) Sensory Neuron:**

These are the neurons which carry impulses to the central nervous system (brain and spinal cord).

**(2) Motor Neurons:**

These neurons carry impulses from central nervous system to the effectors.

Q10: Give some examples of Reflex Actions?

Ans: Examples of reflex actions:

- (1) Watering of mouth on smelling or seeing good food.
- (2) Blinking of eyes when are exposed to strong light.
- (3) Erection of hair due to terror.
- (4) Increasing of heart beat on hearing some loud sound or a bad news.
- (5) Shivering due to cold.

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. The brain is enclosed with in a thin membrane called pia meter.
2. The cereberum is also called the forebrain.
3. The outer part of the cerebrum is composed of pia matter.
4. Spinal cord gives off 31 pairs of spinal nerves.
5. Effectors exist the neurons which carry impulse to the nervous system.
6. Effectors exist the form of glands and muscles.
7. Motor neutron are the neurons which carry impulse to the nervous system.
8. Cell body has a long fibre called axon.
9. Talking, playing and reading are the examples of voluntary actions.
10. There are two types of nerves, sensory neurons and motor neurons.

**C: CHOOSE THE CORRECT WORDS:**

1. Central part of the spinal cord is composed of \_\_\_\_\_ Matter.  
(a) Grey (b) White ✓ (c) Black
2. \_\_\_\_\_ is the net work of intelligence.  
(a) Medulla Oblongata (b) Cerebellum,  
(c) Cerebrum ✓
3. \_\_\_\_\_ is present inside the vertebral column.  
(a) Brain (b) Spinal Cord ✓ (c) Nerve
4. Cerebellum controls \_\_\_\_\_ Actions.  
(a) Voluntary ✓ (b) Involuntary  
(c) Reflection
5. The brain and the spinal cord act as \_\_\_\_\_.  
(a) Responser (b) Effectors  
(c) Co-ordinate ✓

**CHAPTER-3****LIFE ACTIVITIES OF PLANTS**  
**EXERCISE****A: ANSWER THE FOLLOWING QUESTIONS:**

**Q1:** Write down the functions of roots and leaves.

**Ans:** Functions of Roots:

- (1) Roots are main absorbing organs of plants.
- (2) Roots absorb water and dissolved salts (minerals) from the soil.

**Functions of Leaves:**

- (1) Leaves are also main absorbing organs of plants.
- (2) Leaves take in gases i-e oxygen and carbon dioxide from the atmosphere.
- (3) Leaves prepare the food for plants in the presence of sunlight.

**Q2:** What do you mean by osmosis? Describe it with the help of an experiment?

**Ans:** **OSMOSIS:**

The process in which weaker solution is absorbed into the stronger solution.

**Experiment:**

Take some pure water in a beaker. Tie an egg membrane on the mouth of a thistle funnel. Fill the funnel little above the bulb with a strong sugar solution. Place the funnel in the beaker containing water and fix with a stand. Mark the level of sugar solution in the tube of the funnel. After sometime you will see that the level of the solution will rise in the tube and then will become steady. This type of diffusion from weaker to stronger solution is called osmosis. The roots of plants absorb salt solution from

soil through this process. All the cells of the plant body are saturated with water as a result of cell to cell osmosis. In this way the dissolved salts pass through different cells and reach the leaves where the process of photosynthesis takes place.

**Q3:** How many types of membrane are there? Give examples of each?

**Ans:** **Types of membrane:**

There are three types of membrane.

- (1) Permeable membrane.
- (2) Semi permeable membrane.
- (3) Impermeable membrane.

Examples of Permeable membrane:

Cell wall and filter paper are the examples of permeable membrane.

Examples of Semi permeable membrane:

Eggs membrane and animals bladder are the examples of semi permeable membrane.

Examples of Impermeable membrane:

Rubber and polythene bags are the examples of impermeable membrane.

**Q4:** What is shoot system. Name the functions which are performed by this system?

**Ans:** Shoot system:

Stem and leaves make a system called the shoot system. This system performs the following functions for the plant.

- (1) Transpiration.
- (2) Photosynthesis.
- (3) Respiration.

Q5: Define the factors which effect the transpiration.

Ans: Factors effecting the transpiration:

There are four factors which effect the transpiration.

- (1) Light
- (2) Humidity
- (3) Temperature
- (4) Speed of wind

**(1) Light:**

Light is the most important factor which is responsible for the opening and closing of stomata. In day time the stomata remain open and transpiration takes place normally. At the night the stomata remain closed. Thus, the rate of transpiration increases in light and decreases in darkness.

**(2) Humidity:**

There is an increase or decrease in the rate of transpiration according to whether the air is dry or moist. If the atmosphere is dry there will be more transpiration. The dry air removes the vapour very quickly. Loss of water by transpiration in air is very low.

**(3) Temperature:**

Due to the rise in temperature the humidity of air decrease and then there will be an increase in the rate of transpiration. If the temperature is low there will be a decrease in the rate of transpirations. It means the higher the temperature the greater the rate of transpiration.

**(4) Speed of Wind:**

During rapid movement of the wind the transpiration becomes very active.

Q6: What do you mean by transpiration? Explain it with the help of an experiment.

Ans: **Transpiration:**

Plants absorb a large quantity of water from the soil by the root hair. This water is conducted upwards to the aerial parts of plants i.e branches and leaves. Only a very small part of this water is retained in the plant body, while the most part of it lost in the form of vapours. The evaporation of water from the vapours and stem is known as transpiration.

**EXPERIMENT:**

Take a potted plant and put it under a bell jar. The plant is well watered and the pot is covered with polythene sheet. After a short time drops of water will appear on the inner surface of the bell jar. The water has come from the leaves of the plants due to transpiration.

Q7: What is the importance of transpiration?

Ans: **Importance Of Transpiration:**

- (1) This process enables the plant to get rid of excess amount of water.
- (2) The greater the transpiration the greater the absorbtion of water from the soil.
- (3) Absorbtion of water helps the intake of salt from the soil.
- (4) Transpiration also helps the distribution of water throughout the plant body and plants become cooler in this process.

Q8: Define photosynthesis. Write down the factors which effect the process of photosynthesis.

Ans: **Photosynthesis:**

Photo means light, synthesis means building up. Hence photosynthesis is the process by which green parts of the plant specially leaves prepare food for plants.

Factors affecting photosynthesis:

Following are factors which affect the photosynthesis.

- (1) Light
- (2) Carbon dioxide
- (3) Water
- (4) Temperature
- (5) Chlorophyll

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. Water is dissolved salts are absorbed by roots.
2. The cell wall of plant is made up of cellulose.
3. The strong solution in the vacuole of the plant cells is called cell-sap.
4. The evaporation of water from the leaves is known as transpiration.
5. Light is responsible for the opening and closing of stomata.
6. The rate of transpiration for the opening and closing of stomata.
7. Carbon dioxide gas is used during photosynthesis.
8. Greater the light intensity greater the rate of photosynthesis will be.

9. Non-green parts of the leaves do not take part in photosynthesis.
10. Aquatic plants get oxygen from water by diffusion.

**C: CHOOSE THE CORRECT ANSWER:**

1. Cellulose is kind of \_\_\_\_\_ membrane.  
(a) Permeable ✓      (b) Impermeable  
(c) Semi-permeable
2. The root of plant absorb salts solution through \_\_\_\_\_.  
(a) Respiration      (b) Osmosis  
(c) Transpiration ✓
3. The \_\_\_\_\_ air removes evaporated very quickly.  
(a) Dry ✓      (b) moist      (c) Slow
4. \_\_\_\_\_ is the process by which plants manufacture their food.  
(a) Respiration      (b) Transpiration  
(c) Photosynthesis ✓
5. Suitable temperature for photosynthesis is \_\_\_\_\_.  
(a) 15°C to 30°C      (b) 20°C to 25°C  
(c) 20°C to 35°C ✓

**CHAPTER-4****NATURAL ENVIRONMENT  
EXERCISE****A: ANSWER THE FOLLOWING QUESTIONS:**

Q1: What is an ecosystem?

Ans: **Ecosystem:**

Living things interacting with other living organisms and with things such as light, heat, air, water, soil and different mineral form a balanced system called an ecosystem.

Q2: What are the living components of an ecosystem?

Ans: **Living Components of Ecosystem:**

The living component of an ecosystem consists of a community of animals and plants of all types. The green plants play the role of producer in the ecosystem while animals are the consumers since they eat plants.

Q3: What are the non-living components of an ecosystem?

Ans: **Non-Living Components of Ecosystem:**

Non-living materials such as water, carbon-dioxide, oxygen and nitrogen are also used by living things and are being replaced in nature continuously through respiration, transpiration combustion and decay.

Q4: What do you mean by food relationship?

Ans: **Food Relationship:**

All living organisms depends on each other for food. Many animals feed on plants. They are known as herbivores. Some animals like

lion, leopard, wolves and foxes live on other animals. They are known as carnivores. Those animals which live both on plants and animals are known as omnivores.

Q5: What are producers, consumers and decomposers?

Ans: **Producers:**

Living things such as plants can make their own food are called producers.

**Consumers:**

Organisms occurring higher level in the pyramid are called consumer.

**Decomposers:**

Such organisms that depend on the dead bodies or remaining parts of plants and animals are known as decomposers.

Q6: What do you mean by food web?

Ans: **Food Web:**

When food chains are joined together is called food web.

Q7: Describe the cycle of carbon-dioxide.

Ans: **Carbon-dioxide cycle:**

Plants have green colouring material called chlorophyll. During the process of photosynthesis plants used carbon-dioxide from the atmosphere. In this process, sugar is formed which later used in the formation of other food substance such as starch, proteins, fats and oils. In this way carbon-dioxide gets locked-up in the form of food. The plants are eaten by animals so that a

part of the carbon-dioxide becomes a part of their body after the digestion of food.

The carbon-dioxide comes back to nature during the process of respiration in which food is broken down to release carbon-dioxide. In addition carbon-dioxide also comes back by the process of decomposition of plants and animals. Petrol, wood, coal or other plants material release carbon-dioxide when they are burnt.

**Q8:** Describe the cycle of nitrogen.

**Ans:** Nitrogen Cycle:

Nitrogen is also considered very important for life. It is also a part of proteins and other nitrogenous compounds. Free nitrogen in the atmosphere cannot be used by plants directly. The compounds of nitrogen such as nitrates and ammonium compounds presents absorbed by them through their roots. These compounds are used by plants in making proteins. When plants are eaten by animals, the proteins becomes a part of their body. They are used by animals and are excreted from their body in the form of ammonia, urea and uric acid. The organic remains of plants and animals are decomposed by bacteria and fungi releasing ammonia and other simple nitrogenous substance which are used again by plants. Nitrogen fixing bacteria are also found the roots of leguminous plants (eg: Pea, gram, ground nut etc.)

**Q9:** Why is nitrogen an important gas for living organisms?

**Ans:** Nitrogen is an important gas for living organisms because it is a part of protein and other nitrogenous compounds. These compounds are nitrates and ammonium are absorbed by plants through their roots. When plants are eaten by animals, the proteins becomes a part of their body.

**Q10:** What happens when the living organisms decay?

**Ans:** When the living organisms decay, then the substances such as carbon dioxide water, ammonia and minerals are released back to nature. These substances are used again by plants for producing more food.

**Q11:** What are micro-organisms? Give some examples?

**Ans:** Micro organisms:

Such organisms which are not seen by our eyes. These organisms are only seen with the help of microscope are called micro organisms.

Some examples of micro- organisms:

Amobea, Euglena, Paramecium, Bacteria are examples of micro- organisms. Some fungi are also micro- organisms.

**Q12:** Write down the useful effects of micro-organisms.

**Ans:** Useful effects of micro organisms:

Some of the useful effects of micro-organisms are give below:

**A- Decay:**

Decay or decomposition is carried out by some bacteria and fungi. It is a process in which complex organic molecules are broken down to simple inorganic substance like carbon-dioxide and ammonia are released back to the nature in the process. These substances are used again by plants.

**B- Nitrogen Fixation:**

Some bacteria present in the soil making nitrogen available to plants. They convert nitrogen from the air into nitrites and nitrates. These compounds are absorbed by plants and are used in making proteins.

**C- Role of Bacteria in Industries:**

- (1) One type of bacteria converts milk into curd.
- (2) Some bacteria are helpful in preparation of cheese.
- (3) Some bacteria convert sugar-cane juice to vinegar.

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. Plants are called the producers in ecosystem.
2. Bacteria and fungi are called the decomposer of an ecosystem.
3. Carbon-dioxide is a non-living components of an ecosystem.
4. Lion, Cat, leopard are called carnivorous animals.
5. Carnivores eat both plants and animals.
6. The number of producers is always greater than consumers.

7. Food chain when join together make food web.
8. Nitrogen fixing bacteria are present in the leguminous plants.
9. Some bacteria convert sugarcane juice into vinegar.
10. Nitrates and nitrates are the compounds of nitrogen.

**EXERCISE****A: ANSWER THE FOLLOWING QUESTIONS:**

Q1: Name five elements which are present in the earth crust.

Ans: The elements which are present in the earth crust are under as following.

(1) Oxygen = O      (2) Silicon = Si  
 (3) Aluminium = Al      (4) Calcium = Ca  
 (5) Iron = Fe

Q2: How many elements are found naturally?

Ans: 92 elements are found naturally.

Q3: Name four elements which are found in human body.

Ans: The elements which are found in human body are under as following.

(1) Hydrogen = H      (2) Oxygen = O  
 (3) Carbon = C      (4) Nitrogen = N

Q4: Why do we use symbols for elements?

Ans: We use symbols for elements to make communication simpler, easier and understandable.

Q5: Write the names of elements whose symbols are B,O,F,N,H,Fr,I,S,U,P.

Ans:

Sr. No	Symbols	Elements
01	B	Boron
02	O	Oxygen
03	F	Flourine
04	N	Nitrogen
05	H	Hydrogen
06	Fr	Francium
07	I	Iodine
08	U	Uranium
09	P	Phosphorus
10	S	Sulphur

Q6: Write down the Latin names and symbols of the following elements:

(1) Sodium      (2) Iron      (3) Mercury  
 (4) Gold      (5) Silver      (6) Copper  
 (7) Lead      (8) Potassium      (9)  
 Tungston  
 (10) Tin

Ans:

Sr. No	Elements	Latin Names	Symbols
01	Sodium	Natrium	Na
02	Iron	Ferrum	Fe
03	Mercury	Hydragryum	Hg
04	Gold	Aurum	Au
05	Silver	Argentum	Ag
06	Copper	Cuprum	Cu
07	Lead	Plumbum	Pb
08	Potassium	Kalium	K
09	Tungston	Wolfram	W
10	Tin	Stannum	Sn

Q7: Write five points of difference between metal and non metal.

Ans: Deference between metal and non-metal.

Metals	Non – Metals
1. They have metallic shine of lustre.	1. They do not have metallic shine or lustre, except graphite, silicon and iodine.
2. They are good conductors of electricity and heat.	2. They are poor conductors of electricity and heat.
3. They are solid at ordinary temperature except mercury.	3. They are found in all three physical states at ordinary temperature.
4. They can be drawn into wires and can be hammered into sheets.	4. They are neither ductile nor malleable.
5. They can form alloys when combined with other metals and a few non-metals.	5. They combine with metal and one another to form compounds.

Q8: Write down the chemical formula of the following compound:

(1) Sugar	(2) Washing Soda
(3) Baking soda	(4) Chalk
(5) Slake Lime	(6) Nitric Acid
(7) Water	(8) Glucose

Ans:

Sr. No	Compounds	Chemical Formula
01	Sugar	$C_{11}H_{22}O_{11}$
02	Washing Soda	$Na_2CO_3$
03	Baking Soda	$NaHCO_3$
04	Chalk	$CaCO_3$

05	Slake lime	$Ca(OH)_2$
06	Nitric Acid	$HNO_3$
07	Water	$H_2O$
08	Glucose	$C_6H_{12}O_6$

Q9: Define chemical equation, reactants and products.

Ans: **Chemical Equation:**

Chemical equation is the short method of expressing the chemical equation.

**Reactants:**

The chemical which take part in chemical reaction (chemical change) are called reactants.

**Products:**

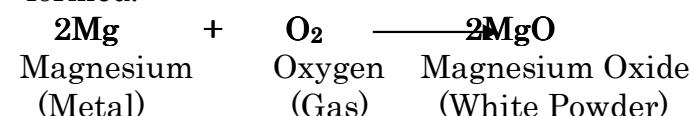
The chemicals which are formed in the chemical reaction (chemical change) are called products.

Q10: Write down the equation of the following metals with oxygen:

(1) Mg      (2) Fe      (3) Cu      (4) Na

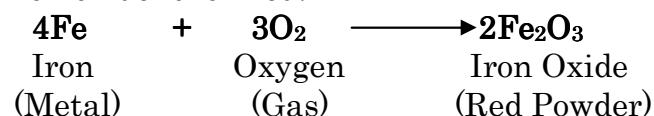
Ans: **(1) Reaction of Mg (Magnesium) with oxygen:**

When Mg (magnesium) is reacted with a  $O_2$  (oxygen), then magnesium oxide  $MgO$  is formed.



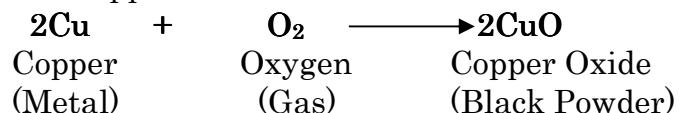
**(2) Reaction of Fe (Iron) with oxygen:**

When fe (iron) is reacted with oxygen then iron oxide is formed.

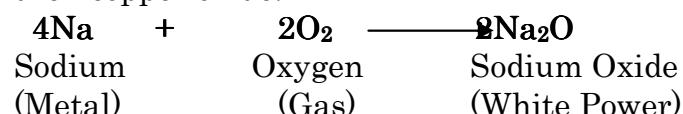


**(3) Reaction of Cu (copper) with oxygen:**

When Cu (copper) is reacted with oxygen then copper oxide.

**(4) Reaction of Na (sodium) with Oxygen:**

When Na (sodium) is reacted with oxygen then copper oxide.

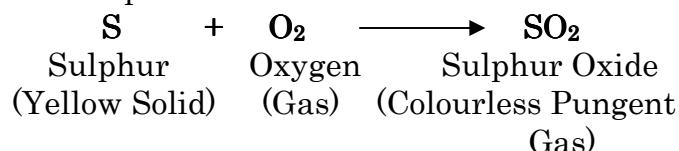


**Q11:** Write down the equation of the following non-metal, with oxygen:

(1) Sulphur (2) Hydrogen      (3)  
Nitrogen

**Ans: (1) Reaction of Sulphur with Oxygen:**

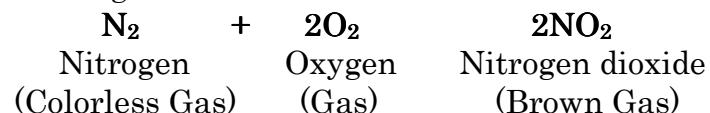
When sulphur is reacted with a  $\text{O}_2$  (oxygen), then sulphur oxide is formed.

**(2) Reaction of Hydrogen with Oxygen:**

When hydrogen is reacted with oxygen then water is formed.

**(3) Reaction of Nitrogen with oxygen:**

When nitrogen is reacted with oxygen then nitrogen dioxide is formed.



**Q12:** Describe and experiment to separate the mixture of sugar, iron filling and sand?

**Ans: Experiment:**

Mix some iron fillings, Sugar and sand together on a piece of paper. A mixture of above elements and compound is formed observe the constituents of the mixture still retain their own properties.

Now place a strong magnet above the mixture. All iron fillings are attracted towards the magnet. In this way iron fillings are separated easily from the mixture.

The remaining mixture of Sugar and sand put in a beaker which contains water. Stir them with a glass rod. After a short while you will see that Sugar is dissolved while sand is settled in the bottom of the beaker. Filter the solution. You will see sand remains on the filter paper and the sugar solution is filtered through the filter paper.

**Q13:** Define compound and mixture and give some examples of each.

**Ans: Compounds:**

A compound is a pure substance that is composed of two or more than two different elements which combine chemically. In a compound the continents loose their own

properties and a new substance with new properties are formed.

**Example:**

Water is a chemical compound of hydrogen and oxygen gases. It is formed when hydrogen gas and oxygen gas are burnt together.



**Q14:** Write down the chemical names of the following formula?

(1)  $\text{NH}_4\text{Cl}$  (2)  $\text{H}_2\text{SO}_4$  (3)  $\text{NH}_3$   
 (4)  $\text{Fe}_2\text{O}_3$  (5)  $\text{CaO}$

**Ans:**

Formula	Chemical Name
$\text{NH}_4\text{Cl}$	Ammonium Chloride
$\text{H}_2\text{SO}_4$	Sulphuric Acid
$\text{NH}_3$	Ammonia
$\text{Fe}_2\text{O}_3$	Ferric Oxide
$\text{CaO}$	Calcium Oxide

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. Metals are good conductors of electricity and heat.
2. Iron sulphide is formed when iron and sulphur heated.
3. In sugar molecule there are 12 atoms of hydrogen.
4. Molecular formula of carbon-dioxide is  $\text{CO}_2$ .
5. The most abundant element which is present in the earth crust is oxygen.
6. Latin name of Tungsten is wolfram.
7. Bromine is a metal which is found in liquid state.
8. Mercury is a non-metal which is found in liquid state.

**CHAPTER-6****SOME COMMON GASES  
EXERCISE**

**A: ANSWER THE FOLLOWING QUESTIONS:**

**Q1:** Describe the occurrence of oxygen gas.

**Ans:** Occurrence of oxygen gas:

Oxygen is present in the air at about 21% by volume in the free state. In the combined state it is found in water which contains about 89% oxygen by weight. It is also found in the earth's crust in various compounds such as silicates, carbonates, oxides and nitrates.

**Q2:** Why do we use  $\text{MnO}_2$  in the preparation of oxygen?

**Ans:** If small quantity of manganese dioxide ( $\text{MnO}_2$ ) is added to potassium chlorate, the formation of oxygen takes place more quickly and oxygen is produced more quickly. The manganese dioxide used, does not take part in the reaction. It only serves to speed up the decomposition of the potassium chlorate to liberate oxygen. It remains unchanged at the end of the reaction.

**Q3:** What do you mean by Catalyst?

**Ans:** Catalyst:

Such a substance, which speeds up a reaction but remains unchanged at the end of the reaction, is called a catalyst.

Q4: Write down the preparation of oxygen gas in the laboratory.

Ans: **Laboratory Preparation of Oxygen:**

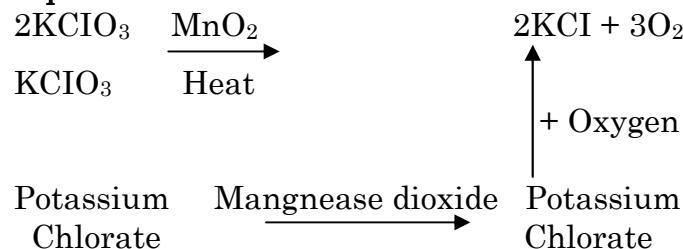
There are several methods for the preparation of oxygen in the laboratory. Some of them are discussed below:

**(1) By Heating Potassium Chlorate:**

In laboratory oxygen gas can be prepared by heating a white powder called Potassium Chlorate ( $KClO_3$ ). The temperature needed to start the reaction is high (i.e. About  $400^{\circ}C$ ) and the rate of formation of oxygen is slow. However, if small quantity of manganese dioxide ( $MnO_2$ ) is added to potassium chlorate, the formation of oxygen takes place more quickly and oxygen is produced more quickly.

The manganese dioxide used, does not take part in the reaction. It only serves to speed up the decomposition of the potassium chlorate to liberate oxygen. It remains unchanged at the end of the reaction.

**Equation of the reaction:**



Q5: How is oxygen gas collected in the gas jar?

Ans: We can collect the oxygen gas in the gas jar by doing this experiment.

**Experiment:**

Put some mixture of potassium chlorate and manganese dioxide in hard glass test tube and set up the apparatus. Start heating the mixture. As the mixture in the tube is heated, bubbles of gas start coming out at the end of the delivery tube. Do not collect the first few bubbles that come through the beehive shelf, as these are only air of the tube. Now place an inverted gas jar which is full of water over the beehive shelf. You will see that gas bubbles rise to the top of the jar and soon fill the gas jar with gas. Oxygen gas is collected in the gas jar by the downward displacement of water, cover the mouth of the jar with the lid under water. Remove the jar and keep it upright on the table. Collect two or three gas jars in this manner.

Q6: Write down four physical properties of oxygen gas.

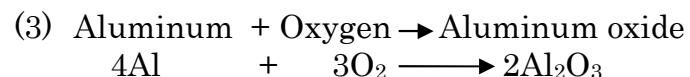
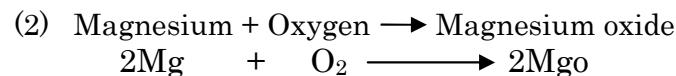
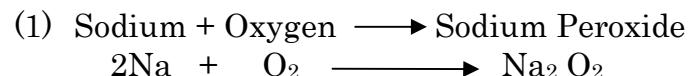
Ans: Physical properties of Oxygen:

- (1) Oxygen is a colourless, odourless and tasteless gas.
- (2) It is very slightly soluble in water.
- (3) It does not burn but supports combustion.
- (4) It liquefies at  $-183^{\circ}C$  and solidifies at  $225^{\circ}C$ .

Q7: Write down the reactions of oxygen with metals. Write chemical equations also.

Ans: **Reaction of Oxygen With Metals:**

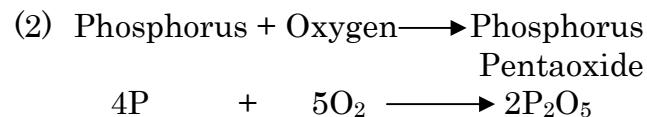
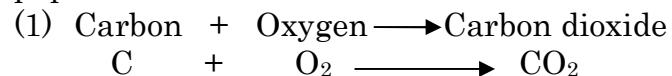
Metals such as sodium (Na), Magnesium (Mg), and Aluminum (Al) react with oxygen to form their oxides. These oxides are basic in nature and turn moist red litmus paper blue.



Q8: Write down the balance equations of the reactions of oxygen with non-metals.

Ans: **Reaction of Oxygen With Non Metals:**

Oxygen reacts with non-metals such as carbon (C), Phosphorus (P) and Sulphur (S) to give their oxides. These oxides are acidic in nature as they turn moist blue litmus paper red.



Q9: Write down the uses of oxygen gas.

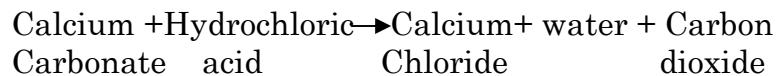
Ans: **USES OF OXYGEN:**

- (1) All living things use oxygen for respiration.
- (2) Oxygen is used as an aid to breathing where natural supply of air is insufficient for examples:
  1. In aeroplane.
  2. In space capsules.
  3. In the sea under water.
  4. On high mountains.
- (3) Oxygen is used in hospitals during operations and for the patient who have difficulty in breathing.
- (4) Welders use oxygen to burn acetylene gas. This flame is called oxacetylene flame. Its temperature is about 2000 °C. This flame is used for cutting and welding metals like iron.
- (5) In space rockets, liquid oxygen mixed with liquid hydrogen is used as fuel.

Q10: How is carbon dioxide prepared in the laboratory?

Ans: **Laboratory Preparation of Carbon Dioxide:**

Carbon dioxide is prepared in the laboratory by the action of dilute hydrochloric acid (HCl) on calcium carbonate or marble chips (CaCO<sub>3</sub>). During chemical reaction carbon dioxide is released while calcium chloride (CaCl<sub>2</sub>) and water (H<sub>2</sub>O) are left behind.



Q11: Write down the physical properties of carbon dioxide.

Ans: **Physical Properties of Carbon Dioxide:**

- (1) Carbon dioxide is a colourless and odourless gas.
- (2) It is moderately soluble in water.
- (3) It changes into a solid at  $-80^{\circ}\text{C}$ . Solid carbon dioxide is also called dry ice.
- (4) It neither burns nor supports combustion.
- (5) It is one and a half times heavier than air.

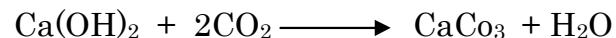
Q12: Write down the chemical properties of carbon dioxide with equations.

Ans: Chemical properties of Carbon dioxide:

- (1) Carbon dioxide dissolves in water and forms carbonic acid which turns blue litmus paper red.



- (2) When carbon dioxide is passed through lime water, it turns milky because insoluble calcium carbonate is formed.



- (3) When more carbon dioxide is passed through the milky suspension, the solution becomes clear. This is because soluble calcium bicarbonate is formed.



B: **FILL IN THE BLANKS WITH CORRECT WORDS:**

1. Managese dioxide ( $\text{MnO}_2$ ) is used as catalyst in the preparation of oxygen gas.
2. Formula of sodium chloride is  $\text{NaCl}$ .
3. When sulphur burns in air it produces Sulphur dioxide.
4. Oxygen can be solidity at gasolin gases are used as fuel.
5.  $\text{CaCO}_3 + \text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$ .
6. The temperature of oxyacetylene flame is 2000  $^{\circ}\text{C}$ .
7. In space rockets, liquid oxygen with liquid hydrogen gases are used as fuel.
8. Solid carbon dioxide is also called dry ice.
9. Carbon dioxide is one and half times heavier than air.
10. When carbon dioxide is passed through lime water it turns milky.

**SOLUTIONS  
EXERCISE****A: Answer the following questions:**

Q1: Define, solute, solvent, solution.

Ans: **Solute:**

The sugar or other solid that dissolve in water is known as the solute.

**Solvent:**

The water or other liquid in which the solid dissolves is known as solvent.

**Solution:**

When solute and solvent mix with each other then they are known as solution.

Q2: Give one example of 9 types of solution.

Ans: **(1) Gas Into Gas:**

Example: “Air” which is the mixture of oxygen, Nitrogen, Carbon dioxide, rare gases, and water and dust particles.

**(2) Gas Into Liquid:**

Example: Soft drinks which is the mixture of carbon dioxide in water.

**(3) Gas Into Solid:**

Example: Hydrogen Palladium solution.

**(4) Liquid Into Gas:**

Example: Water vapours in air.

**(5) Liquid Into Liquid:**

Example: Alcohol water solution.

**(6) Liquid Into Solid:**

Example: Sodium amalgam i.e.  $Hg + Na$ .

**(7) Solid Into Gas:**

Example: Smoke i.e. Carbon particles in air.

**(8) Solid Into Liquid:**

Example: Sugar or salt in water.

**(9) Solid Into Solid:**

Example: Alloy of copper i.e. Brass which is the mixture of copper and zinc.

Q3: Why is water called universal solvent?

Ans: Water is called “Universal Solvent” because it dissolves so many substances.

Q4: What function does aqueous solution play in living things?

Ans: Aqueous solutions play an important function in most living things.

(1) The transport of food and oxygen and the removal of carbon dioxide and other waste products from our bodies occurs through aqueous systems.

(2) Water and aqueous solution are main components of environment, agriculture, industrial processes and our everyday life.

Q5: Define; saturated solution, unsaturated solution and super satrurated solution.

Ans: **Saturated Solution:**

Such a solution that can hold no more of the substance at a particular temperature, is said to be a saturated solution.

**Unsaturated Solution:**

A solution which can dissolve more solute in it at a particular temperature is known an unsaturated solution.

**Super Saturated Solution:**

Saturated solution when heated, has the capacity to retain more dissolved substance. “Solution that is more concentrated than a saturated solution is known as a super “saturated solution”.

Q6: Define crystallization.

Ans: **Crystallization:**

Crystal is a solid which possess as a definite geometrical shape and the process by which these crystals are prepared is called "Crystallization".

Q7: Define solubility. Describe the factors that affect solubility.

Ans: **Solubility:**

The solubility of the solute is taken to be the quantity required to achieve a saturated solution in a given quantity of the solvent. Solubility is also defined as; "The Solubility of a solute in a solvent at a particular temperature is the number of grams of the solute necessary to saturate 100gm of the solvent at that temperature".

**Factors Affecting Solubility:**

Following are the factors which affect the solubility:

(a) Temperature (b) Pressure

**(Nature of Solute and Solvent:)**

Solute and solvent may be polar (as  $H_2O$ , Alcohol) and non polar (as benzene, petrol. Polar and ionic solutes easily dissolve in polar solvents. Where as non-polar solutes easily dissolve in non-polar solvents. Hence it is said that like dissolves like. For example common salt (NaCl) being an ionic compound easily dissolves in polar solvent like water but is insoluble in non-polar solvent like benzene or petrol.

(1) **Temperature:**

It is often observed that solubility of many solutes in solution generally increases with the increase in temperature. For example solubility of sugar increases with increase in temperature. It means more sugar dissolve in hot water than cold water. There are some solute whose solubility decreases with the increase in temperature. For example calcium oxide is less soluble in hot water than cold water dissolved in water because it evolves heat when dissolves in water. Gases are also more soluble in cold solvent than in hot solvent. For example carbon dioxide is more soluble in cold water than hot water.

(2) **Pressure:**

Solubility of gases increases with the increase in pressure. Carbon dioxide is filled in soda water bottles under pressure. Whenever a soda water bottle is opened, carbon dioxide comes out with bubbles, because the pressure in the bottle is released, resulting in decrease in the solubility of the gas.

Q8: What are electrolytes and non-electrolytes?

Ans: **Electrolytes:**

Those substance whose solutions conduct electricity are called electrolytes.

**Non Electrolytes:**

Those substance whose solutions do not conduct electricity are called Non electrolytes.

Q9: How can you prove that sodium chloride solution is an electrolyte?

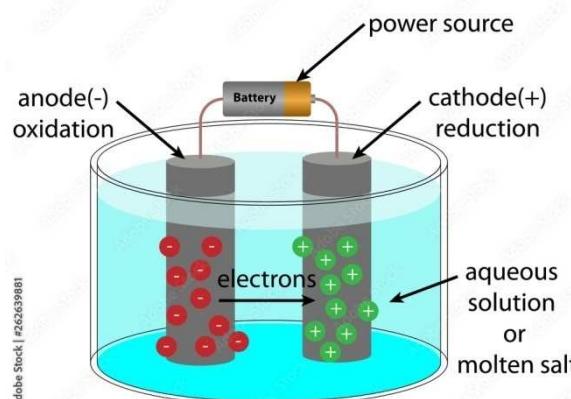
Ans: (1) Yes, sodium chloride is an electrolyte because sodium chloride can break into its constituent ions when dissolved in a polar solvent.

(2) Sodium chloride is a strong electrolyte and it completely ionizes into its ions i.e, one is a cation and the other is an anion .

Q10: Draw the diagram of electrolytic cell.

Ans:

### **Electrolytic Cell**



### **B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. The solid that dissolves is known as solute.
2. Candle wax dissolve in heated oil.
3. Solution that is more concentrated than a saturated solution is known as super saturated solution.
4. A solid which possess a geometrical shape is called crystals

5. Common name of sodium chloride is table salt.

6. Sodium Nitrate is more soluble in water than silver chloride.

7. Solubility of calcium oxide is less in hot water.

8. In non-electrolytes electricity is not passed.

9. Carbon dioxide is more soluble in cold water.

10. In soda water Carbon dioxide gas is not dissolved.

**CHAPTER-8****ACIDS, BASES AND SALTS**  
**EXERCISE****A: ANSWER THE FOLLOWING QUESTIONS:**

**Q1:** What is acid? Name three acids which are in gaseous states and two acids which are in solid states.

**Ans:** Acids:

The word acid derived from the Latin word "acidus" means sour. They are sour in taste. The sour taste is a characteristic of a class of substances that are called "acids".

Acids which are in gaseous states:

Hydrochloric acid (HCl), Hydrobromic acid (HBr) and Hydroiodic acid (HI) are in gaseous states.

Acids which are in solid state:

Lactic acid, Citric acid and Benzoic acid are in solid states.

**Q2:** Name the acids which can be prepared in the laboratory and how?

**Ans:** Acids can be prepared in the laboratory. We can prepare acids from other compounds; for example, hydrochloric acid can be prepared from sodium chloride. Nitric acid can be made from potassium nitrate and Sulphuric acid from Sulphur. These three acids are very dangerous to taste. They acids are also called mineral acids.

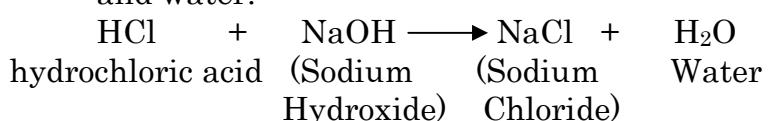
**Q3:** Write four physical properties of acid.

**Ans:** (1) They have a sour taste.  
(2) They turn blue litmus paper and methyl orange paper red.  
(3) Aqueous solution of acids conduct electricity.  
(4) Strong acids destroy fabrics, animals tissues and affect skin.

**Q4:** Write down the equations of the reaction of hydrochloric acid with  
(1) Sodium Hydroxide (2) Calcium carbonate  
(3) Zinc

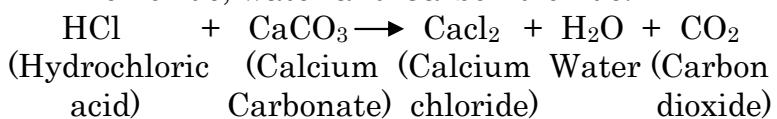
**Ans:** (1) Reaction of hydrochloric acid with sodium hydroxide and its equation:

When hydrochloric acid (HCl) is reacted with sodium hydroxide, then it forms salt (NaCl) and water.



(2) Reaction of hydrochloric acid with Calcium carbonate and its equation:

When hydrochloric acid is reacted with Calcium carbonate, then it forms Calcium chloride, water and Carbon dioxide.



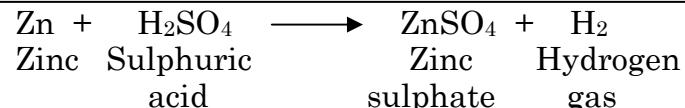
(3) Reaction of hydrochloric acid with Zinc and its equation:

When hydrochloric acid is reacted with Zinc then it forms zinc chloride and hydrogen gas.



**Q5:** Which gas is produced when Zinc reacts with Sulphuric acid? Write the equation of chemical reaction.

**Ans:** Hydrogen gas is produced when Zinc reacts with Sulphuric acid.



**Q6:** Write the name and formula of the metallic oxide and metallic hydroxide.

**Ans:** Some metallic oxide:

- (1) Iron trioxide =  $\text{FeO}_3$
- (2) Chromium trioxide =  $\text{CrO}_3$
- (3) Titanium dioxide =  $\text{TiO}_2$
- (4) Copper oxide =  $\text{Cu}_2\text{O}$

Some metallic hydroxide:

- (1) Sodium hydroxide =  $\text{NaOH}$
- (2) Potassium hydroxide =  $\text{KOH}$
- (3) Magnesium hydroxide =  $\text{Mg(OH)}_2$
- (4) Calcium hydroxide =  $\text{Ca(OH)}_2$

**Q7:** Write four physical properties of bases.

**Ans:** Four physical properties of bases:

- (1) They have a bitter taste.
- (2) They have a slippery to touch.
- (3) They conduct electricity.
- (4) They turn indicators such as red litmus to blue, colourless phenolphthalein to pink, methyl orange to yellow and turmeric paper to brown.

**Q8:** Write down the name of three alkalis.

**Ans:** Three Alkalies:

- (1) Calcium oxide
- (2) Sodium hydroxide
- (3) Magnesium hydroxide

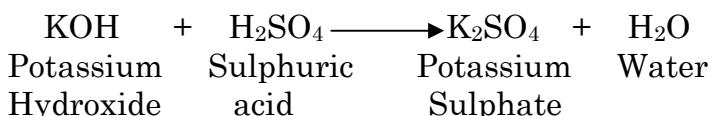
**Q9:** Write down the chemical properties of Bases with equation.

**Ans:** Chemical properties of Bases:

- (1) Bases react with fats to form soap.

(2) Bases are able to dissolve proteins and certain other organic compounds.

(3) Bases are neutralizes acids. All bases (alkali) react with acid to prepare salt and water.



**Q10:** What is an indicator? How many types of indicators are there? Describe each of them.

**Ans:** Indicators:

Any substance which help us to indicate the nature of a substance whether it is in acid or base by the change in its colour is called an indicator.

#### Types of Indicator:

The main types of indicator are given below:

##### **(1) LITMUS PAPER:**

It is special type of blue or red paper. It is used as indicator.

- (a) In acid- blue litmus paper turns red.
- (b) In base- red litmus paper turns blue.

##### **(2) PHENOLEPHTHALEIN:**

- (a) In acid it is colourless.
- (b) In base it is pink.

##### **(3) METHYL ORANGE:**

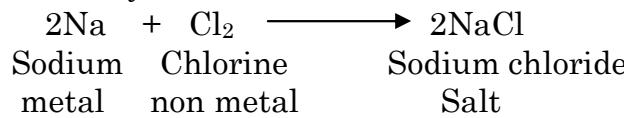
- (a) In acid it is orange-red.
- (b) In base it is yellow.

Q11: How can salts be prepared? Describe three methods with chemical equation.

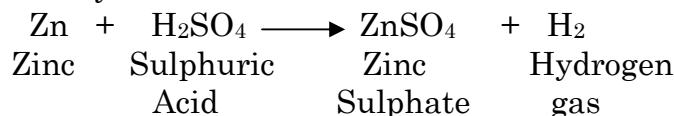
Ans: **Preparation of Salts:**

When acids react with bases, then salts and water are formed. This process is called neutralization. Salts can also be prepared by different methods. A brief description of some of important methods are given below:

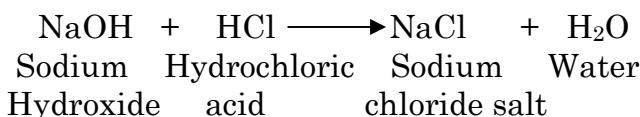
(1) By reaction of metals with non-metal.



(2) By the reaction of an acid on metal:



(3) By the neutralization of an acid with a base:



Q12: Give four examples of salts.

Ans: Four examples of salts:

- (1) Sodium Chloride (NaCl)
- (2) Ammonium Chloride (NH<sub>4</sub>Cl)
- (3) Copper Sulphate (CuSO<sub>4</sub>)
- (4) Silver Nitrate (AgNO<sub>3</sub>)

Q13: Write the uses of:

- (1) Sulphuric acid
- (2) Hydrochloric acid
- (3) Nitric acid.

Ans: **Uses of Sulphuric Acid:**

- (1) It is used in the manufacture of fertilizers.
- (2) It is used in the manufacture of rayon, paper, plastic and detergents.
- (3) It is used for refining of petroleum.
- (4) It is in the motor batteries and lead accumulators.
- (5) It is used in the manufacture of paints.

**Uses of Hydrochloric Acid:**

- (1) It is used laboratory reagent.
- (2) It is used in the preparation of chlorine.
- (3) It is used to extract glue from bones.
- (4) It is used in the production of dyes, paints etc.

**Uses of Nitric Acid:**

- (1) Large amount of nitric acid is used in the manufacture of fertilizer.
- (2) It is used in the manufacture of dyes.
- (3) It is used as laboratory agent.
- (4) It is used as nitrating agent.
- (5) It is used in the manufacture of cellulose, lacquers and smokeless gun powder.

Q14: Write the uses of:

- (1) Sodium Hydroxide
- (2) Calcium Hydroxide
- (3) Magnesium and Aluminum Hydroxide.

Ans: **Uses of Sodium Hydroxide:**

- (1) It is used in the manufacture of soap and petroleum products.
- (2) It is used in textile and paper industry.
- (3) It is used in bleaching and dyeing process as well as for mercerizing the cotton clothes.

(4) It is used in the manufacture of artificial silk.

**Uses of Calcium Hydroxide:**

- (1) It is used as the sewage treatment.
- (2) It is used in the preparation of paper.
- (3) It also has medical and dental uses. For example: root canal fillings, often contain calcium hydroxide.
- (4) It is a very compound in the preparation of ammonia.

Q15: Write three uses of salts.

Ans: **Three Uses of Salts:**

- (1) Sodium chloride (common salt) is an ingredient of food, and a major raw material for many chemical manufacturing processes, such as sodium hydroxide and hydrochloric acid production.
- (2) Salts are also used as fertilizers such as di-ammonium hydrogen phosphate, ammonium nitrate, potassium sulphate.
- (3) Salts such as iron phosphate and potassium iodate are used to make up the deficiency of iron, phosphorus and iodine in the diet. Iron to prevent anemia, iodine to prevent goiter.

**B: FILL IN THE BLANKS WITH CORRECT WORDS:**

1. The word acid derived from Latin word "acidus".
2. Citric acid occurs in lemon.
3. Formic acid occurs in sting of bees.
4. Aqueous solution of acids conducts electricity.

5. Sodium choloride salts is formed when NaOH and HCl react.
6. Formula of calcium carbonate is CaCo<sub>3</sub>.
7. Basis have a slippery touch.
8. Sodium is the member of metal.
9. In base methyl orange is changed into yellow colour.
10. Ammonium nitrate and potassium sulphate are used as fertilizers.

**SOUND****EXERCISE****A- Answer the following questions:**

**Q1:** What is sound? How is sound produced?

**Ans:** Sound:

Sound is a form of energy. It is produced when a body or any object is vibrating.

**Q2:** Describe an experiment which shows a material medium is essential for the propagation of sound.

**Ans:** Let us perform an experiment to demonstrate the propagation of sound.

**Experiment:**

Suspend an electric bell in a bell jar pass its wires through a cork fixed in its mouth. Switch on the bell. You will hear the sound of the bell. Now start removing air from the bell jar with the help of an exhaust pump. The loudness of the sound decreasing ultimately, although the hammer is still seen striking the bell. This experiment shows that air is necessary for the propagation of sound. Infact a material medium such as air, water and metals etc. are needed for the sound to travel from one place to another.

**Q3:** Describe compression and rarefaction.

**Ans:** **Compression:**

When we strike the skin of a drum, it vibrates and moves out, it is called compression.

**Rarefaction:**

When we strike the skin of a drum, it vibrates and moves in, it is called rarefaction.

**Q4:** What is the difference between noise and musical sound?

**Ans:**

<b>Noises</b>	<b>Musical Sound</b>
Sounds which produces an unpleasant effect on the ear is called noise. The sounds of donkey, barking dogs and bomb blast are the examples of noise.	Some sounds such as the sound of singing bird, flute and the tune of violin have a pleasant effect on the ear. These sounds are called musical sounds.

**Q5:** Write down the names of the characteristics of sounds that make them different.

**Ans:** Characteristics of Sound:

Sounds have some characteristics that make them different. Following are the characteristics of sound.

(1) Loudness      (2) Pitch      (3) Quality

**Q6:** Define loudness. Describe the factors on which loudness depends.

**Ans:** Loudness:

The characteristics of sound by which we can distinguish between loud and faint sound is called loudness.

Factors on which loudness depends:

The loudness depends on the following factors.

(1) Amplitude:

The loudness of sound depends upon the amplitude of the vibration. The greater the amplitude, the louder the sound.

The maximum displacement of the body on either side of the equilibrium position is known as amplitude.

**Surface Area of the Body:**

The Loudness of sound also depends upon the distance of the sources of sound from the listener. We move away from a drum being beaten violently to avoid the uncomfortably loud sound.

**Q7:** Define pitch, frequency. On which factor the pitch of the sound depends?

**Ans:** **Pitch:**

The characteristics of sound by which we can distinguish between grave and shrill sound is called pitch.

**Frequency:**

The number of waves per second is called the frequency.

**The Factor on which Pitch Depends on:**

The pitch of a sound depends upon the frequency of the vibrating body. The greater the frequency, the higher will be the pitch of sound.

**Q8:** Define quality, Which characteristics of sound helps us to distinguish different sounds.

**Ans:** **Quality:**

The characteristics of sound by which we distinguish sounds produced by the different bodies is called quality.

For example, if your friends are talking in a room you can recognize them by listening to their voice. Similarly if different musical instruments are played together the sound of these instruments can easily be distinguished due to quality of sound.

**Q9:** What are the harmful effects of noise?

**Ans:** **Harmful Effects of Noise**

- (1) It causes loss of sleep which is harmful for health.
- (2) It keeps us away from thinking and disturb doing our work in the best way.
- (3) Continuous noise damages hearing and also cause deafness.
- (4) A high level of noise also causes headache, may upset the stomach and cause high blood pressure.

**Q10:** How can we control the sound pollution?

**Ans:** **Controlling Ways of Sound Pollution:**

- (1) In homes carpets, curtains and drapes should be used because these material absorb sound waves.
- (2) Factories and vehicles should be equipped with noise absorbing instruments.
- (3) The trees between houses and busy roads should be planted because they protect us from harmful noise.

**Q11:** What is echo? How can we hear the echo of our sound?

**Ans:** Echo:

When sound waves strike a surface, these turns back. This reflected sound is known as an echo.

Echo is heard only when the reflected sound reaches your ear more than one tenth (1/10) of a second after the original sound.

Q12: What are the uses of echoes?

Ans: **Uses of Echoes:**

- (1) Echoes are used to find the depth of water.
- (2) Bats listen to echoes of their own sounds as the sound bounces off obstacles and avoid them.

**B- FILL IN THE BLANKS WITH CORRECT WORDS:**

- (1) Sound is a form of energy emitted by a body when it is vibrating.
- (2) The sound waves travel in all straight line.
- (3) The sound which produces unpleasant effect on the ear is called noise.
- (4) Musical sound produces pleasant effect on the ear.
- (5) The maximum displacement on either side of the equilibrium position is called amplitude.
- (6) The larger surface area produces noise sound.
- (7) The difference between grave and shrill sound is called pitch.
- (8) The number of vibration per second is called the frequency.
- (9) The pitch of the sound depends upon the frequency of vibrating body.
- (10) The reflection of sound is called an echo.

**CHAPTER 10**

**REFLECTION OF LIGHT  
EXERCISE**

**A: ANSWER THE FOLLOWING QUESTIONS:**

Q1: Define reflection of light. Which surface reflect light strongly?

Ans: **Reflection of Light:**

When light is travels through a medium and it strikes the surface of an other medium, a part of it is thrown back along a particular direction in the same medium. This phenomenon is called reflection of light. Light reflects strongly on shiny surfaces.

Q2: Define the following terms with the help of diagram.

- (1) Incident ray      (2) Reflected ray
- (3) Normal              (4) Angle of incidence
- (5) Angle of reflection.

Ans: **(1) Incident ray:**

The ray coming out from the source is known as incident ray. The  $\overline{OA}$  is incident ray.

**(2) Reflected ray:**

The ray formed after striking of incident ray from pole is known as reflected ray. The  $\overline{OB}$  is incident ray.

**(3) Normal:**

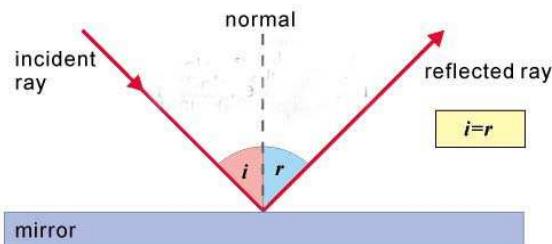
The perpendicular line on the mirror is known as normal.

**(4) Angle of incidence:**

The angle subtended by incident ray and normal is known as angle of incidence i. e  $\angle i$

**(5) Reflected angle:**

The angle formed by reflected ray and normal is known as reflected ray i.e  $\angle r$



Q3: Write the laws of reflection of light.

Ans: **Laws of Reflection of Light:**

- (1) The angle of reflection is equal to the angle of incidence. Mathematically  

$$\angle i = \angle r$$
- (2) The incident ray, reflected ray, the normal and the vertices of angle of incidence and angle of reflection lie in the same plane.

Q4: Describe regular and irregular reflection of light.

Ans: **Regular Reflection of Light:**

Regular reflection occurs when parallel rays of light strike with an ideal smooth plane surface. In regular reflection, reflection parallel rays of light remain parallel after reflection.

**Irregular Reflection of Light:**

Irregular reflection occurs when parallel rays of light strike with an irregular non smooth surface.

In case of irregular reflection, parallel rays of light does not remain parallel after reflection.

Q5: Write down the importance of irregular reflection in daily life.

Ans: **Importance of Irregular Reflection:**

- (1) Due to this reflection, sun light reaches us before sunrise and persists for times even after the sunset.
- (2) Due to this reflection, we get sufficient light in our rooms and other places where sunlight does not reach directly.
- (3) Due to this reflection, we can see non luminous objects.
- (4) Due to this reflection, sunlight reaches to each leaf of a tree and photosynthesis takes place at a large scale.

Q6: Describe the properties of image formed in a plane mirror.

Ans: **Properties of Image Formed in Plane Mirror:**

- (1) The images are found to be laterally inverted. That is the right side of the object appears as the left side of the image.
- (2) Images are formed of same size as that of the object.
- (3) The image formed is virtual, that is because it can not be obtained on a screen.
- (4) The distance of object and image are equal from the mirror.

Q7: What is spherical mirror? Describe its two kinds.

Ans: **Spherical Mirror:**

The mirror whose reflecting surface is a part of polished hollow sphere is known as Spherical Mirror.

**Types of Spherical Mirror:**

There are two kinds of spherical mirror.

- (1) Concave mirror or Converging mirror
- (2) Convex mirror or diverging mirror

**Convex Mirror:**

- (1) In convex mirror, the hollow or concave side is polished.
- (2) In convex mirror, the reflection occurs at the bulging side.
- (3) They diverge the parallel rays from a point.
- (4) They can form only virtual image.

**Concave Mirror:**

- (1) In concave mirror, the bulging side is polished.
- (2) In concave mirror, the reflection occurs from its hollow side.
- (3) They converge the parallel rays at a point.
- (4) They can form real and virtual both images.

**Q8:** Define the following terms about spherical mirror:

- (1) Centre of Curvature (2) Pole
- (3) Principal Axis (4) Principal Focus
- (5) Focal length (6) Radius of Curvature
- (7) Aperture.

**Ans:** (1) **Centre of Curvature:**

The centre of curvature of the hollow sphere of which the mirror is apart is known as the centre of curvature.

**(2) Pole:**

The Centre of the spherical mirror is called the pole. It is denoted by P.

**(3) Principal Axis:**

The straight line passing through the centre of curvature and the pole of the mirror is called the principal Axis. It is denoted by PC.

**(4) Principal Focus:**

The ray coming parallel to principal axis after reflection converges to a point in case of concave mirror, this point is known as principal focus. It is denoted by F.

**(5) Focal Length:**

The distance between principal focus and pole is called the Focal Length.

**(6) Radius Of Curvature:**

The distance from the centre of curvature to the reflecting surface is called radius of curvature.

**(7) Aperture:**

The diameter of the mirror is known as aperature.

**B- FILL IN THE BLANKS WITH CORRECT WORDS:**

- (1) In an object is placed between C and F the image is formed beyond C.
- (2) Virtual image can not be brought on the screen.
- (3) Real image is always inverted.
- (4) The sun light takes 8 minutes and 20 seconds to reach the earth.
- (5) The image of an object in the plane mirror is laterally inverted.
- (6) If an object is at 'C' of a concave mirror then the size of the image will be same.

- (7) Extremely large image will be formed if an object is place at the focus of the concave mirror.
- (8) The ray which strikes the mirror is called reflection of light.
- (9) The angle between the normal and the reflected ray is called angle of incidence.
- (10) Centre of the spherical mirror is called the centre of curvature.

**CHAPTER-11****REFRACTION OF LIGHT****EXERCISE**

**A: ANSWER THE FOLLOWING QUESTIONS:**

**Q1:** What is refraction? Explain it with examples.

**Ans:** Refraction:

Refraction is the bending of a light ray as it crosses the boundary between one medium to another, thus causing a change in direction.

**Example:**

When a ray of light travels from a less denser medium to denser medium, the ray will refract towards the normal.

When a light ray passes from a denser medium to less denser medium, the ray will refract away from the normal.

**Q2:** What happen when a ray of light enters from a rare medium to a denser medium?

**Ans:** When a ray of light enters from a rare medium to a denser medium, the speed of light reduces and it bends towards the normal.

**Q3:** What happens when a ray of light passes through denser medium to rarer medium?

**Ans:** When a ray of light enters from denser medium to a rare medium, the velocity of the light increase.

Q4: What happens when light enter from one medium to another along the normal?

Ans: Refraction occurs when light travels from one medium to another which changes the speed at which the light. This causes light to bend upon incidence with the interface of a new material.

Q5: Define lens. How many types of lenses are there? Define each of lense.

Ans: **Lense:**

A lens is simply a spherical transparent glass piece which refracts the light rays when they are passed through it.

**Kinds of lens:**

There are two kinds of lense:

(1) Convex Lens (2) Concave Lens.

**Convex Lens:**

The lens which is thicker at the centre than its edges is known as convex lens.

**Concave Lens:**

The lens which is thinner at the centre and thicker at the edges is known as concave lens.

Q6: Describe the rules which help in the formation of image by a convex lens.

Ans: **Formation of Images By A Convex Lens:**

The three rules which are used for tracing an image are given below:

(1) A ray passing through the optical centre of lens does not bend but passes straight through it.

(2) A ray parallel to the principal axis after refraction in the lens will pass through the principal focus of the lens.

(3) A ray passing through the principal focus and then passing through the lens will emerge parallel to the principal axis.

Q7: Write down the uses of lens.

Ans: **Uses of Lens:**

(1) Lenses are used in compound microscope.

(2) Lenses are used in telescope.

(3) Lenses are used in camera.

(4) Lenses are used in spectacles.

Q8: Describe the dispersion of light.

Ans: **Dispersion of Light:**

Sunlight is made of seven colours. Sometimes after rain, white light of the sun is split up into seven colours. In the rainbow, the splitting of white light into its component colours is known as dispersion of light.

**B:- FILL IN THE BLANKS WITH CORRECT WORDS:**

(1) When light enters the glass block from air it bends towards the normal.

(2) The lens which is thicker at the centre is called convex lens.

(3) The centre of the lens is thicker than it is called convex lens.

(4) A concave lens also called the diverging lens.

Image is formed at the side of the object if an object is placed between principal focus and optical centre of the convex lens.

- (6) Sun light is consisted of seven colours.
- (7) A black object absorbs all colours all light.
- (8) Violet colours of the spectrum is bent most.
- (9) The distance between F and O of the lens is called focal lenth of the lense.
- (10) Air is a rare medium and glass is denser medium.

**CHAPTER-12****ELECTRICITY AND ELECTROMAGNETISM  
EXERCISE****A: ANSWER THE FOLLOWING QUESTIONS.**

Q1: How does electricity help us in house hold work?

Ans: Electricity helps us in different house hold works. It is used to run the home appliances such as fan, TV, refrigerator, bulb, energy saver, computer etc.

Q2: Describe the process of electroplating.

Ans: Electroplating:

Electroplating is the process by which a fine layer of a percious metal is deposited on another metal such as gold is electroplated on silver.

Q3: What is meant by Electrolysis?

Ans: Electrolysis:

Electrolysis is the process in which an electrolyte is broken up into positive and negative ions by passing an electric current through the solution of electrolyte.

Q4: Describe the conversion of electrical energy into another forms of energies.

Ans: Electrical energy converts itself into other forms of energy. In electric bell, it converts itself into sound energy. It is converted into heat energy when it is passed through electric iron or heater. In electric crane it is converted into magnetic energy. From the above observation we can say that electricity is a form of energy because it can be converted into other forms of energy.

Q5: Describe an experiment which shows that mechanical energy is changed into electricity?

Ans: Mechanical energy can be changed into electricity. For example: electric generator changes their mechanical energy into electrical energy.

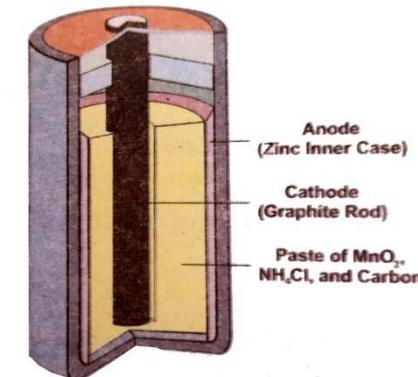
**Experiment:**

Take a coil of wire and connect the ends of wire to the terminals of a galvanometer. It is an instrument which is very sensitive to detect the weak electric current. Now take a bar magnet and move in the coil. When the magnet moves in the coil, the needle of the galvanometer moves to other side when the magnet moves outside of coil then the needle of the galvanometer moves in opposite direction. This experiment shows that current is produced by the movement of a magnet in the coil.

Q6: Describe the structure of a dry cell with the help of a diagram.

Ans: **Structure of Dry Cell:**

The most common dry cell is a zinc carbon cell. The zinc container is negative electrode and carbon rod is positive electrode. The inside of the zinc container is coated with the mixture of ammonium chloride ( $\text{NH}_4\text{Cl}$ ) and starch. The space between the carbon rod and zinc container is filled with manganese dioxide ( $\text{MnO}_2$ ) and carbon powder. Ammonium chloride is an electrolyte in a dry cell. The cell is then sealed so that the wet chemicals may not fall or leak. The zinc container is covered out side by card board and paper.



Q7: Describe the structure and working of a solar cell.

Ans: **Structure of A Solar Cell:**

Sunlight which is a form of energy is changed into electrical energy with the help of solar cell. A solar cell consists of a thick disc of silicon to which a small amount of arsenic or boron has been added.

**Working of Solar Cell:**

When sunlight strikes the silicon disc, the electrons move from one side of the disc to another producing a weak electric current. Hundreds of such cells must be used to get a reasonable amount of electric current.

Q8: How does nuclear energy produce electricity?

Ans: When the nucleus of a heavy atom like uranium is broken into two nearly equal parts then a large amount of energy is released. The process of splitting a nucleus is known as nuclear fission. In nuclear reactor, nuclear fission takes place, which produce large amount of heat energy. This heat energy is used to convert water into steam.

The steam runs a turbine which is connected to an electric generator. Then generator produces electricity.

**Q9:** What is fuse? Why it is used in the electric circuit?

**Ans:** All houses and buildings have away to keep them safe. A fuse is put in the circuit. A fuse is a small metal wire of low melting point that completes the circuit. If the electric current is heavy, this wire melts and circuit is broken. Thus, saving the electrical appliances or the wiring from damage, a circuit breaker is also used.

**Q10:** Write four safety rules to avoid electrical accidents.

**Ans:** **Four Safety Rules:**

- (1) Do not touch an electric wire which fallen from power line.
- (2) Never use an electric appliance or touch electric wiring with wet hands.
- (3) Do not pull the plug to switch off electrical appliance.
- (4) Put the switch off in the position before inserting or removing the plug.

**Q11:** How can a piece of iron be made electromagnet?

**Ans:** An electromagnet is a piece of iron which behaves as a magnet as long as the electric current flows through the coil around it. As soon as the current stops the piece of iron loses its magnetization and becomes a simple piece of iron. An electromagnet can be made

by placing a piece of iron in a coil of wire. When the current passes through the coil the magnetic field of the coil is concentrated in the iron, forming a strong magnet.

**Q12:** Write down the uses of electromagnet.

**Ans:** **Uses of Electromagnet:**

- (1) Electromagnet is used in Galvano Meter.
- (2) It is used in Telephone.
- (3) It is used in Electric Bell.
- (4) It is used to separate iron from mixture of magnetic and non-magnetic substances.
- (5) It is used to produce strong magnetic field for high power motors.
- (6) It is used in electric crane which lifts and imported heavy iron pieces from one place to other place.

**B- FILL IN THE BLANKS WITH CORRECT WORDS:**

- (1) In electric bell electricity is changed into sound energy.
- (2) Galvanometer is a sensitive instrument which detect weak current.
- (3) A fuse is a small metal wire of low melting point.
- (4) The process of splitting a nucleus is called fission.
- (5) A solar cell consists of a thin disc of silicon and arsenic.
- (6) The container of dry cell is made of zinc metal.
- (7) Aluminium chloride is an electrolyte in a dry cell.

- (8) Hydrogen gas is evolved during the reaction in a voltaic cell.
- (9) Such device which changes heat into electric current is called a solar cell.
- (10) The nucleus of an atom has proton and neutron.