L - 6 : CHANGES AROUND US

Checkpoint 1:

1. True **2.** False **3.** True **4.** False **5.** True

Checkpoint 2:

1. No, physical change is usually reversible.
2. Yes, rusting of iron is a chemical change.
3. A new material is formed in a chemical change.
4. Yes, tearing a paper is a physical change.

Let's Drill Our Skills

A) MCQs : **1.** all of these **2.** physical **3.** melting of butter
4. Irreversible change **5.** Inflating a balloon

B) Fill in the blanks : **1.** chemical **2.** chemical **3.** physical; chemical
4. Irreversible 5. physical; chemical

C) Define the terms :

1. **Reversible change:** A change which can be undone or reversed is called reversiblechange.
2. **Irreversible change :** A change which cannot be undone or reversed is called irreversiblechange.
3. **Physical change :** A change in which no new material is formed is called a physicalchange.
4. **Chemical change :** A change in which a new material is formed is called a chemicalchange.

D) Write True or False against the statement:

1. True 2. False 3. False 4. True 5. True

E) Very Short Answer Type Questions :

Q1. Is metling of an ice cream a reversible or an irreversible change?
Ans. Melting of an ice cream is a reversible change.

Q2. Is breaking of a cup a physical or a chemical change?
Ans. Breaking of a cup is a physical change.

Q3. Why is breaking of a glass a physical change?
Ans. Breaking of a glass is a physical change because no new substance isformed.

Q4. What new substances are formed on burning wood?
Ans. Ash and some gases are formed on burning wood.

Q5. Name the change that cannot be undone or reversed.
Ans. Chemical change cannot be undone or reversed.

F) Short Answer Type Questions :

Q1. What happens when ice is heated? Is it a reversible or an irreversible change? Justify your answer.

Ans. When ice is heated, it melts into liquid water. It is a reversible changebecause when liquid water is frozen, it changes back into ice.

Q2. What happens when lemon juice is mixed with baking powder? Is it a physical or a chemical change? Justify your answer.

Ans. When lemon juice is mixed with baking powder, a gas is formed. It is a chemical change because on mixing these substances, a new substance (gas) is formed.

Q3. Idli batter is steamed to get idlis. Is it a reversible or an irreversible change? Justify your answer.

Ans. Steaming of idli batter to get idlis is an irreversible change because we cannot get back idli batter from idlis.

Q4. Think of at least six changes and classify them as reversible and irreversible changes.

Ans. (a) Melting of ice into liquid water – Reversible change
(b) Evaporation of water into water vapour – Reversible change
(c) Condensation of water vapour into liquid water – Reversiblechange
(d) Melting of wax into liquid wax – Reversible change
(e) Baking of cake batter – Irreversible change
(f) Curdling of milk – Irreversible change.

Q5. Why is burning of paper an irreversible change?

Ans. On burning paper, ash and some gases are formed. We cannot get back paper from its ash. Therefore, burning of paper is an irreversible change.

G. Long Answer Type Questions :

Q1. Physical and chemical changes can occur simultaneously. Explain this statement with the help of an example.

Ans. Physical and chemical changes can occur simultaneously. For example, on burning a candle, solid wax melts which is a physical change, and at the same time, vapour of wax burns to produce a new substance, which is a chemical change.

Q2. Distinguish between reversible and irreversible changes.

Ans. Differences between reversible and irreversible changes are :

REVERSIBLE CHANGE	IRREVERSIBLE CHANGE
A change which can be undone or reversed is called a reversible change.	A change which cannot be undone or reversed is called an irreversible change.
A reversible change is a temporary change.	An irreversible changeis a permanent change.
Dissolving, melting, freezing and folding are examples of a reversible change.	Burning, baking, cooking, etc., of any substance are examples of an irreversible change.

Q3. Distinguish between physical and chemical changes.

Ans. Differences between physical and chemical changes are :

PHYSICAL CHANGE	CHEMICAL CHANGE
A physical change is that in which no new material (substance) is formed.	A chemical change is that in which new material (substance) is formed.
Most physical changes are reversible.	Most chemical changes are irreversible.
Evaporation and condensation are examples of physical changes.	Burning and cooking are examples of chemical changes.

Skill-Based Questions :

Q1. Why is burning of a candle considered physical as well as chemical changes?

Ans. Burning of a candle is considered physical as well as chemical changes because on burning the candle, solid wax melts which is a physical change, and at the same time, vapour of wax burns to produce a new substance, which is a chemical change.

Q2. Why is metlting of butter a physical change?

Ans. Melting of butter is a physical change because during the melting no new substance is formed.

L - 7 : LIVING AND NONLIVING THINGS

Checkpoint 1:

1. Living things are called organisms.
2. Cell is the basic unit of life.
3. The living substance of a cell is called protoplasm.
4. Sunflower moves its head towards the sun.
5. All animals and nongreen plants are heterotrophs.

Checkpoint 2:

1. respire | 2. waste | 3. air tubes | 4. water | 5. response

Checkpoint 3:

1. True | 2. True | 3. False | 4. False | 5. True

Let's Drill Our Skills

A) MCQs : 1. excretion **2.** internal and irreversible **3.** Not following any life cycle
4. Amoeba **5.** locomotion 6. stomata

B) Fill in the blanks : 1. single **2.** gills **3.** photosynthesis
4. Resin 5. seeds

C) Match the columns :

1) Taking in air and its release - Breathing
2. Sprouting of seed - Germination
3) Openings on the surface of leaf - Stomata
4. Breaking down of food to release energy - Respiration
5. Green plants - Autotrophs

D) Define the terms :-

1. **Breathing** : The process of inhaling fresh air into lungs and exhaling used air from lungs through our nose is called breathing.

2. **Respiration** : The process of burning or oxidation of food inside the body cells to release energy is called respiration.

3. **Autotrophs** : The organisms which can make their food from carbon dioxide and water using solar energy are called autotrophs.

4. **Heterotrophs** : The organisms which cannot make their own food and eat plants or other organisms are called heterotrophs.

E) Very Short Answer Type Questions :

Q1. Name the change in the surroundings that makes us to react to it.
Ans. The change in the surroundings that makes us to react to it is calledstimulus.

Q2. In which process oxidation of food releases energy?
Ans. In respiration, oxidation of food releases energy.

Q3. Name the period for which an organism lives.
Ans. The period for which an organism lives is called lifespan.

Q4. What is the process of emergence of a seedling from a seed called?
Ans. The emergence of a seedling from a seed is called germination.

Q5. What are single-celled organisms called?
Ans. The single-celled organisms are called unicellular organisms.

Q6. Name two egg-laying animals.
Ans. Fish and birds are egg-laying animals.

Q7. Which excretory product is formed by the breakdown of proteins?
Ans. Urea is the excretory product formed by the breakdown of proteins.

F) Short Answer Type Questions :

Q1. What is the difference between locomotion and movement?
Ans. The movement of a whole organism from one place to another is called locomotion, whereas the change in the position of any body part of an organism is called movement.

Q2. Why do living organisms need food?
Ans. Living organisms need food to get the energy stored in food. They get this energy by oxidation of food inside the body cells. They use this energy for various life processes.

Q3. How do animals reproduce?
Ans. Animals reproduce by giving birth to young ones or by laying eggs. For example, animals like dogs, cats, cows, etc., give birth to young ones, whereas fishes, frogs, birds and lizards lay eggs which hatch into young ones.

Q4. What is the basic difference in the growth pattern of plants and animals?
Ans. Plants grow throughout their life but animals stop growing after a particular age.

Q5. What is the difference between respiration and breathing?
Ans. Respiration is the process of burning or oxidation of food inside the body cells to release energy, whereas breathing is the process of inhaling fresh air into lungs and exhaling used air from the lungs.

Q6. What are meant by stimulus and response?

Ans. Stimulus is the change in the environment that evokes an organismto react to it, whereas the reaction to the stimulus is called response.

G. Long Answer Type Questions :

Q1. Describe different characteristics of living things.

Ans. Living things have following characteristics:

1. They are made up of cells.
2. They show movement.
3. They need food.
4. They respire to get energy.
5. They excrete waste and other harmful substances formed inside the body.
6. They respond to changes in their surroundings.
7. They reproduce by producing their own kind.
8. They grow in size by the additionof new cells.
9. They have a definite lifespan.

Q2. Differentiate between living and nonliving things.

Ans. Differences between living and nonliving things are as follow:

LIVING THINGS	NONLIVING THINGS
Living things are made up of cells.	Nonliving things are notmade up of cells.
Living things can repair the damage caused to their body.	Nonliving things cannot repair the damage.
Living things change according to changes in theirenvironment (adaptation).	Nonliving things are unable to adapt.
Living things showmovements.	Nonliving things do not move on their own.
Living things need food forgrowth, repair and energy.	Nonliving things do not take food.
Living things respire to getenergy.	Nonliving things do not respire.
Living things produce excretory waste.	Nonliving things do not excrete.
Living things respond tostimuli.	Nonliving things do not respond to stimuli.
Living things reproduce their own kind.	Nonliving things do not reproduce.
Living things grow. Thegrowth is internal and irreversible.	Nonliving things do not grow. The increase in size is external and reversible.
Living things follow adefinite life cycle.	Nonliving things do not follow any life cycle.
Living things have a definite lifespan.	Nonliving things do not have a definite lifespan.

Q3. How do plants give response to stimulus? Explain with example.

Ans. The different stimuli to which plants give response are changes in light, temperature, touch, moisture, etc. The roots of plants always grow downward towards water and the stem grows upward towards light. The leaves of some plants also respond to touch stimulus. For example, leaves of touch-me-not plant get folded when touched.

Skill-Based Questions :

Q1. Why is a car called nonliving thing though it moves?
Ans. A car is called non living thing because it moves by some external force.

Q2. Why does touch-me-not plant fold its leaves when touched?
Ans. Touch-me-not plant folds its leaves when touched because it gives response to the stimulus of touch.

Q3. Why are green plants called autotrophs?
Ans. Green plants are called autotrophs because they can make their food themselves using raw materials.

L - 9 : PLANTS - FORM AND FUNCTIONS

Checkpoint 1:

1. trunk **2.** Creepers **3.** climber **4.** shoot system **5.** Roots

Checkpoint 2:

1. Stem **2.** Flattened stem **3.** Stem tendril **4.** Corm **5.** Thorns

Checkpoint 3:

1. Leaves **2.** reticulate **3.** Thalamus **4.** Calyx **5.** petiole

Let's Drill Our Skills

A) MCQs : 1. mustard 2. stilt root 3. sweet potato 4. absorption of water 5. venation

B) Match the columns :

1. Accessory whorls	-	Calyx and corolla
2. Leaves modified into spines	-	Cacti
3. Transport of water and minerals to leaves	-	Stem
4. Loss of excess of water from plants	-	Transpiration
5. Taproot	-	Dicot plants
6. Modified stem	-	Potato
7. Stilt roots	-	Bamboo and sugarcane
8. Fibrous roots	-	Monocot plants

C) Define the terms :-

1. **Sessile** : The leaves without a petiole are called sessile leaves.
2. **Primary root** : The main root of taproot system is called primary root.
3. **Perennation** : Perennation is the survival of some plants from one season to the next by means of stored food in their underground part.
4. **Pollination** : Transfer of pollen grain from anther to stigma is called pollination.

D) Differentiate between the following:

1. **Herbs and shrubs :** Herbs are small plants with soft and green stem having a lifespan of few months to one year, whereas shrubs are medium-sized woody plants which survive for several years.
2. **Taproot and fibrous root :** The root which is formed of one main long root and its branchesis called taproot, whereas the root which is formed of cluster of fibre-like roots at the base of the stem is called fibrous root.

3. **Monocot leaf and dicot leaf :** Monocot leaves are sessile and have parallel venation, whereas dicot leaves are stalked and have reticulate venation.
4. **Calyx and corolla :** Calyx is the outermost whorl of the flower formed of green leaf-likesepals, whereas corolla is a whorl just inside the calyx and is made up of brightly coloured or scented petals.

E) Give reasons for the following :-

1. **Stem in cacti and succulents is green and fleshy.**
   Cacti and succulents are desert plants which grow in the scarcity of water. To save water, the leaves of cacti get modified into spines and to carry out the main function of leaves which is photosynthesis, its stem becomes green. The stem of succulents stores water and becomes fleshy.

2. **Petals are brightly coloured and sweet scented.**
   Petals are brightly coloured and sweet scented to attract insects for pollination.

3. **Some leaves in pea form thread-like structures.**
   Some leaves in pea form thread-like structures called leaf tendrils to provide support to its weak stem to climb by coiling around some object.

4. **Why do some stems store food?**
   In some plants, stems stored food to be used during unfavourable season when their food preparing green aerial part does not survive.

E) Very Short Answer Type Questions :

Q1. What is the network of veins and veinlets in the lamina of leaf called?
Ans. The network of veins and vein lets in the lamina of leaf is called venation.

Q2. What is the modified stem of onion called?
Ans. The modified stem of onion is called bulb.

Q3. Name the roots which provide additional support to the plant?
Ans. Stilt roots provide additional support to the plant.

Q4. What is the flower having both stamens and carpels called?
Ans. The flowers having both stamens and carpels are called bisexualflowers.

F) Short Answer Type Questions :

Q1. Give two functions of root.
Ans. (a) Roots anchor the plant in the soil.
(b) Roots absorb water and minerals from the soil.

Q2. What is the difference between taproot and fibrous root?
Ans. The root which is formed of one main long root and its branches is called taproot, whereas the root which is formed of cluster of fibre-like roots at the base of the stem is called fibrous root. Taproot is found in dicot plants like gram, bean, pea, mango, etc. Fibrous root is found in monocot plants like maize, wheat, rice, grass etc.

Q3. State the function and example of a stem tendril.
Ans. Stem tendril provides support to weak stem by coiling around some object. Stem tendril is found in grapevine and passion flower.

Q4. Mention the difference between androecium and gynoecium.
Ans. **Androecium** is the collection of stamens which form the male reproductive organs of a flower.
Gynoecium is the female reproductive part of the flower. It is formed of one or many carpels.

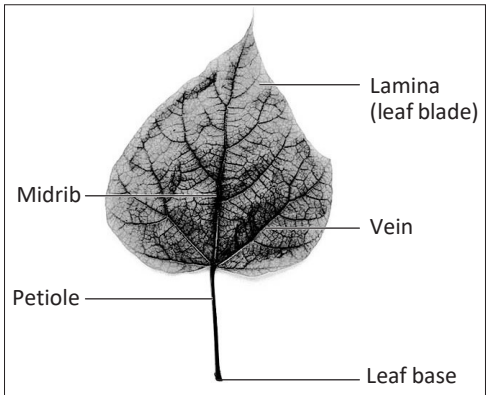
Q5. Give three main functions of leaves.

Ans. (a) Leaves manufacture food by the process of photosynthesis.
(b) Leaves expel excess of water through stomata by the process of transpiration.
(c) Leaves carry out respiration by breathing in oxygen and breathing out carbon dioxide through stomata.

G. Long Answer Type Questions :

Q1. With the help of a well-labelled diagram, describe the structure of a leaf.

Ans. A leaf is attached to the stem with its **leaf base.** The stalk of the leaf is called **petiole.** It connects leaf base with leaf blade. The leaf blade is called **lamina.** It is the green, flat and expanded part of the leaf. The petiole of leaf extends in lamina as **midrib.** The midrib branches into **veins** which further branch into fine veins called **veinlets.**



Structure of a leaf

Q2. Write the functions of stem.

Ans. **1.** Stem supports branches, leaves, flowers and fruits.
2. It keeps leaves spread out so that they can get enough sunlight.
3. Stem conducts water and minerals absorbed by roots and food manufactured by leaves to other parts of the plant.
4. In some plants, stem is modified to carry out following functions:
   a. It becomes green to manufacture food as in cactus.
   b. It stores food by growing underground for perennation as in potato, ginger, etc.
   c. Some branches of stem become thread-like structures called tendrils to support the weak stem as in grapevine and passion flower.
   d. Stem modifies into thorns to protect the plants from grazing animals as in rose, lemon, etc.

Q3. Explain the structure of flower with the help of a diagram.

Ans. A flower has following parts:

Pedicel: It is the stalk of the flower with which it is attached to the plant.

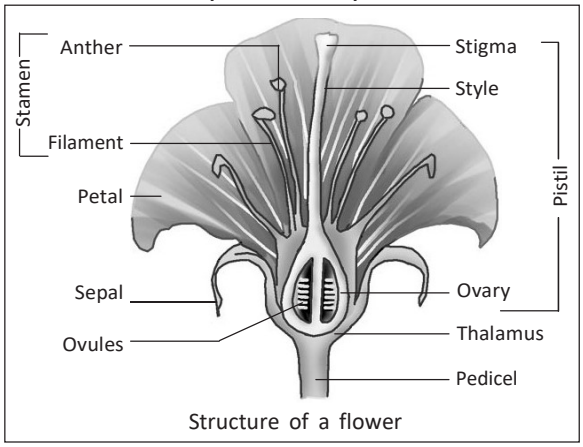
Thalamus: It is the upper swollen end of the pedicel to which all floral parts are attached.

Sepals: They are green leaf-like structures that form outermost whorl of the flower called calyx.

Petals: They are brightly coloured and scented leafy structures that form the whorl called corolla.

Stamens: They are male reproductive organs which form the third whorl of the flower called androecium.

Carpels or pistils: They are the female reproductive organs which form the fourth whorl of the flower called gynoecium. Each carpel is made of a terminal expanded part called stigma. A long, thread-like middle part called style and a basal swollen part called ovary. The ovary contains ovules.



Structure of a flower

Q4. Write some modifications of stem with examples.

Ans. The stem can have following modifications:

(i) The stem of cactus becomes green and flattened to carry out photosynthesis.

(ii) Stems of potato, ginger, gladiolus and zimikand grow underground and store food for perennation.

(iii) Some branches of the stem of grapevine and passion flower modify into thread-like structures called stem tendrils. They support the weak stem by coiling around some support.

(iv) Stems of rose, lemon and *Bougainvillea* modify into thorns to protect the plant from grazing animals.

Skill-Based Questions :

Q1. Which whorls of a flower are called accessory whorls and why?

Ans. Calyx and corolla are called accessory whorls because they do not take part directly in the process of reproduction.

Q2. Flowers that open at night are white in colour. Why?

Ans. Flowers that open at night are white in colour to attract insects for pollination as white colour is visible in dark.

Q3. Some flowers produce nectar. Why?

Ans. Nectar is a sweet liquid. Some flowers produce nectar to attract insects which help in pollination.

Q4. Ankit found a small plant without leaves. He observed it and found that it has fibrous roots. What will be the type of venation in its leaves.

Ans. The plant has fibrous roots which are found in monocot plants.Therefore, its leaves will have parallel venation.

L – 10 : BODY MOVEMENTS

Checkpoint 1:

1. bristle like 2. adhesive pads 3. boat-shaped 4. wings

Checkpoint 2:

1. bony 2. 33 3. three 4. pelvis

Checkpoint 3:

1. hinge 2. cartilage 3. muscles 4. shocks; friction
5. biceps

Let's Drill Our Skills

A) MCQs : 1. shoulder bone 2 earthworm 3. cockroach 4. skull bones
5. three

B) Fill in the blanks : 1. bones; cartilages 2. invertebrates 3. skull 4. bone marrow
5. Spinal cord 6. triceps

C) Define the terms :-

1. **Locomotion :** The movement of an animal as a whole from one place to another is called locomotion.

2. **Synovial joints** : The joint where one bone moves freely on the other is called synovial joint.

D) Very Short Answer Type Questions :

Q1. Name the hard framework present within the body.
Ans. The hard framework present within the body is called skeletal system.

Q2. Which muscles control the movement of arms?
Ans. Biceps and triceps muscles control the movement of arms.

Q3. Which tissue attaches muscles to the bone?
Ans. Tendon attaches muscles to the bone.

Q4. What is the ring-shaped bony structures that surround and protect the spinal cord called?
Ans. The ring-shaped bony structures which protect the spinal cord are called vertebrae.

Q5. What is the flexible connective tissue band which joins the two bones and keeps them in position called?
Ans. Ligament joins the two bones and keeps them in position.

E) Short Answer Type Questions :

Q1. How does a pivot joint differ from a ball and socket joint?
Ans. In a pivot joint, one bone rotates on the rounded or conical end of the other bone in many planes, i.e., up and down and side-to-side. On the other hand, in a ball and socket joint, the end of one bone is rounded as a ball which fits into a socket in the other bone. The bone with ball-like head freely moves in all directions.

Q2. How are ligaments different from tendons?
Ans. Ligaments are bands of flexible connective tissue which hold and keep two bones in position at a joint, whereas tendons are bands of tough and fibrous connective tissue which connect muscles to bones.

Q3. How does an earthworm move?
Ans. An earthworm moves by crawling movements produced by the alternate contraction and relaxation of muscles of the body wall. While moving, earthworm holds the rear part of the body to the surface and extends its front part. Then the extended front part holds the surface and rear part is released and is pulled forward. By repeating these movements, the earthworm crawls ahead on the ground.

Q4. Explain the movement of cockroach.
Ans. A cockroach has three pairs of legs for walking and running. The first pair of legs pulls the body forwards and the third pair of legs pushes the body from behind. This movement is repeated. It also has two pairs of wings to fly.

Q5. Explain how bones move.
Ans. Bones move at the joints by the contraction and relaxation of muscles attached to them. As muscles work in pairs, when one muscle of the pair contracts, the other one relaxes. For example, we raise our arm by the relaxation of triceps and contraction of biceps muscles which pull the arm up.

G. Long Answer Type Questions :

Q1. What is joint? Explain different types of joints with examples.
Ans. The point where two bones are joined together is called a joint. Joints are of following types:

a) **Immovable or fixed joints:** These joints are found between the skull bones where bones join together to form a single protective covering.

b) **Partially movable joints:** These joints allow partial movement of bones. For example, joint between ribs and breastbone.
c) **Freely moveable joints or synovial joints:** These are the joints where one bone moves freely on the other. These joints are of five types like Ball and socket joint, Hinge joint, Pivot joint, Gliding joint and Saddle joint etc.

Q2. Write the functions of skeletal system.
Ans. The framework on bones is called skeleton. It forms the skeletal system. Following are the functions of skeletal system:
1. Skeletal system gives shape and support to the body.
2. It protects the delicate internal organs like brain, heart, lungs etc.
3. It provides movement to our body parts with the help of muscles.
4. Bones also store minerals like calcium and phosphorus.
5. Bones contain bone marrow, which forms the blood cells.

Q3. Explain the characteristics present in birds that help them to fly.
Ans. Birds have following characteristics that help them to fly:
a) Their body is spindle-shaped or streamlined to make the way through air.
b) Their bones are hollow but strong. They are filled with air. This makes the body of a bird light for flying in air.
c) Their forelimbs are modified into wings.
d) Their shoulder bones are strong.
e) The breastbone of a bird is broad for the attachment of breast muscles.
f) They have powerful breast muscles to move the wings up and down.

Q4. What are the special features present in fish that help it to survive in water?
Ans. A fish has following features for swimming:
a) The body of a fish is boat-shaped and streamlined. This body shape offers least resistance while swimming.
b) Their body muscles create wave-like movements of the body to push the fish forward.
c) Tail of a fish helps in changing the direction of movement while swimming.
d) The paired fins of a fish help to move forward.
e) The unpaired fins of a fish keep the balance of body while swimming.

Skill-Based Questions :

Q1. Some long bones have red bone marrow. Why?
Ans. Some long bones have red bone marrow for the formation of redblood cells.

Q2. The head of long bones is covered with cartilage cap. Why?
Ans. The cartilage cap on the head of long bones protects them fromfriction when one bone moves over the other.

Q3. Earthworm has small bristle-like setae. What is their use to the earthworm?
Ans. The setae in earthworm provide grip on the surface while crawling and thus, help the earthworm in movement.

L - 13 : ELECTRICITY AND CIRCUITS

Checkpoint 1:

1. positive 2. filament 3. electrolyte 4. electric charge 5. battery

Checkpoint 2:

1. True 2. True 3. False 4. True 5. False

Checkpoint 3:

1. Materials which allow the flow of electric current through them are called electric conductors.
2. Yes, rubber is an insulator because it does not allow the flow of electric current through it.
3. Electric conductor such as metal wires are used for making electric circuits.
4. Never touch an electric switch, plug or electric device with wet hands.

Let's Drill Our Skills

A) MCQs : 1. tungsten 2. aluminium 3. thermal power plant 4. silver
5. Alessandro Volta 6. battery

B) Fill in the blanks : 1. two 2. insulator 3. closed path 4. metals; rubber
5. fused

C) Define the terms :-

Electric switch : An electric switch is a device which can start or discontinue the working of an electrical device, without disturbing its connections.

Electric current : The flow of electric charge in an electric circuit is the electric current.

Insulator : A material which does not allow the flow of electric current through it is called insulator.

Conductor : A material which allows the flow of electric current through it is called conductor.

D) Very Short Answer Type Questions :

Q1. What does a closed path for the flow of electric current call?
Ans. A closed path for the flow of electric current is called an electric circuit.

Q2. Which types of materials do not allow electric current to flow through them?
Ans. Bad conductors of electricity or insulators do not allow electric current to flow through them.

Q3. Which device is used to put a circuit on or off?
Ans. A key or switch is used to put a circuit on or off.

Q4. Name the first source of electric current.
Ans. The first source of electric current is cell.

Q5. Name the elctrolyte used in dry cell.
Ans. The paste of ammonium chloride is used as electrolyte in dry cell.

Q6. Where is electricity generated at large scale?
Ans. At large scale, electricity is generated at hydropower plants, nuclear power plants and thermal power plants.

F) Short Answer Type Questions :

Q1. Differentiate between open switch and closed switch.
Ans. When the two ends of the switch are disconnected, it is called an open switch, whereas when the two ends of the switch are connected to each other, it is called a closed switch.

Q2. Why do the electrical appliances and tools have their handles covered with insulating materials?

Ans. The electrical appliances and tools have their handles covered with insulating materials, so that the user may not get electric shock while working with them.

Q3. What will happen if the connecting wire of an electric circuit breaks down, while a device is working?

Ans. If the connecting wire of an electric circuit breaks down, the flow ofelectric current will stop in the circuit and this will put the device off.

Q4. What is an electric circuit? Mention its different types.

Ans. An electric circuit is a closed path for the flow of electric current from one terminal of the cell to its other terminal via electric components. Electric circuit is of two types:

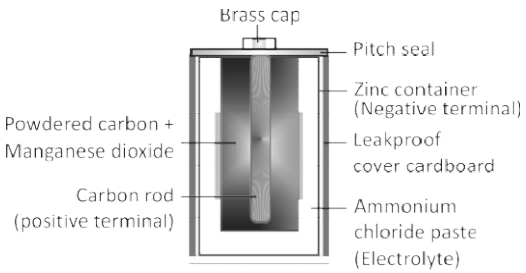
Open circuit: A circuit with an open switch.

Closed circuit: A circuit with a closed switch.

Q5. Differentiate between anode and cathode.

Ans. Anode is the negative terminal of a cell, whereas cathode is the positive terminal of the cell. In a closed electric circuit, the electric current flows from cathode to anode of the cell.

F. Long Answer Type Questions :



Q1. Explain the structure of a dry cell with the help of a diagram.

Ans. **Structure of a dry cell:** A dry cell has following components:

Anode (negative terminal) : Zinc

Cathode (positive terminal) : Carbon coated with MnO_2

Electrolyte: Ammonium chloride

The zinc container in a dry cell itself acts as negative electrode(terminal). The carbon rod forms the positive electrode (terminal).It is coated with MnO_2 and powdered carbon. Ammonium chloride acts as an electrolyte. The zinc container is placed in a leakproof cover made of cardboard and its top is sealed with pitch.Usually, a brass cap is mounted on the carbon rod.

Q2. Mention the differences between insulators and conductors with examples.

Ans.

INSULATORS	CONDUCTORS
Materials which do not allow the flow of electric current through them are called insulators or bad conductors of electricity.	Materials which allow the flow of electric current through them are called good conductors or conductors of electricity.
e.g. : paper, plastic, cotton, rubber, dry air, pure water, dry wood, glass, dry clothes, etc.	e.g. : metals like gold, silver, copper, aluminium, etc., salt solutions, moist air, impure water, graphite, etc.

Q3. Write some precautions to be taken while handling electricity.

Ans. Following precautions should be taken while handling electricity:

1. Never play with sockets or electric wires.
2. Never touch an electric switch, plug or device with wet hands or barefoot.
3. Always wear dry rubber slippers or stand on a dry wooden or plastic base while using an electrical appliance.
4. In case of a short circuit or a spark in a switch, put it off immediately with the help of a plastic or wooden stick.
5. In case of a fire in electric wires, never use water to extinguish it. In such a situation, first switch off the mains, then use dry sand to extinguish the fire.

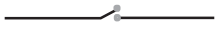
Q4. Write some applications of conductors and insulators.

Ans. **Application of conductors:** Conductors of electricity are used for making electric wires, switches, plugs, sockets and inner parts of electrical devices.

Applications of insulators:

a) Insulators like rubber and plastics are used to cover electric wires, handles of metal tools, electrical appliances, etc., to save the user from electric shocks.
b) Electricians use rubber gloves for safeguard while working with electric devices and circuits.
c) The workers in industries and factories who operate heavy electrical machines are provided with rubber footmats to stand upon and rubber gloves for safe working.

Q5. What do you mean by an open and a closed switch? Draw their diagrams.
Ans. When the two ends of a switch are disconnected, it is called an openswitch, whereas when the two ends of a switch are connected to each other, it is called a closed switch.
Diagrams of open and closed switches are as follows:



Open switch

Closed switch

Skill-Based Questions :

Q1. An electrician working with electric connections, often holds one of the two electric wires connected to an electric socket, having electric current in it. He is not harmed in any way. Give reason.
Ans. An electrician always uses insulated shoes, gloves and pliers. Due to insulated shoes, his body is not earthed and the electric current through the body is not complete. Hence, electric current does not flow through his body. On the other hand, insulated gloves and pliers do not allow electric current to pass through his body. In both the cases, he is not harmed.

Q2. What happens inside a human body when it receives an electric shock?
Ans. When a human body receives an electric shock, the electric current starts flowing through the body. The resistance of the body causes the tissues to heat up and hence, tissue damage is caused.

L - 14 : INTRODUCTION TO MAGNETISM

Checkpoint 1:

1. (a) Iron, nickel (b) Copper, plastic
2. (a) Magnet (b) Man-made or artificial magnet (c) Magnetite or lodestone

Checkpoint 2:

1. poles 2. north-south 3. Similar 4. Dissimilar 5. Repulsion

Checkpoint 3:

1. When a magnet loses its power, it is called demagnetised.
2. Do not hit or beat a magnet with anything.
3. Keepers are pieces of soft iron which are used to store magnets.
4. Magnets are used in electric generators to generate electricity.
5. Magnets should be kept away from television.

Let's Drill Our Skills

A) MCQs : 1. north-south direction 2. south pole 3. poles 4. soft iron
5. aluminium wire

B) Fill in the blanks :
1. non-magnetic **2.** permanent **3.** poles **4.** Magnetic compass
5. earth

C) Differentiate between the following :-

1. Natural and artificial magnets :

NATURAL MAGNETS	ARTIFICIAL MAGNETS
The magnet found in nature is called natural magnet. It is formed of oxides of iron.	The magnet prepared by scientists from pieces of iron is called artificial magnet.
The natural magnet cannot be given the desired shape.	An artificial magnet can be given a desired shape as may be required for a particular use.

2. Magnetic and nonmagnetic materials :

MAGNETIC MATERIALS	NON-MAGNETIC MATERIALS
Materials which are attracted by magnets are called magnetic materials.	Materials which are not attracted by magnets are called nonmagnetic materials.
e.g. : iron, nickel, cobalt and their alloys.	e.g. : wood, plastic, paper, cotton, glass, copper, aluminium, etc.

E) Very Short Answer Type Questions :

Q1. Name the natural magnet.
Ans. Magnetite or lodestone is natural magnet.

Q2. Name a substance which is used to make good permanent magnets.
Ans. Alnico is used to make good permanent magnets.

Q3. Name one magnetic material.
Ans. Nickel is a magnetic material.

Q4. Mention one nonmagnetic material.
Ans. Copper is a nonmagnetic material.

Q5. Where does the power of a magnet become negligible.
Ans. The power of a magnet becomes negligible at its centre.

E) Short Answer Type Questions :

Q1. How was magnet discovered?
Ans. Magnet was discovered 4,000 years ago at Magnesia in Greece by chance by a shepherd named Magnes. One day, he was herding his sheep and found the nails in his shoes . The metal tip of his stick stuck to a large black rock on which he was standing. Later, this type of rocks was named as magnetite.

Q2. Describe an activity to show that magnets can be helpful in finding directions.
Ans. Activity to show that magnets can be helpful in finding directions: Tie a bar magnet at one end of a 25–30 cm long thread and suspend it from a wooden stand. Allow the magnet to come at rest. Meanwhile, mark the directions on a piece of paper and place it on the base of stand, with its centre just below the magnet. Note the direction in which the magnet comes to rest. Now, disturb the magnet and allow it to come to rest again. Again, note the direction in which it aligns itself. Repeat this step many times. Each time, the bar magnet comes to rest with its poles pointing in the north-south direction. Therefore, magnets can be useful in finding directions.

Q3. How should we store bar magnets when they are not in use?
Ans. When bar magnets are not in use, they should be stored in pairs with their poles opposite to each other using magnetic keepers.

Q4. Why should magnets be kept away from things like television, radio, etc.?

Ans. The functioning of electrical and electronic devices gets affected in the presence of magnets. Therefore, magnets should be kept away from things like television, radio, etc.

Q5. Why should magnets be handled carefully?

Ans. Magnets should be handled carefully because if they are dropped frequently, hammered, heated or brought into contact with other magnets repeatedly, they lose their magnetism and become demagnetised.

G. Long Answer Type Questions :

Q1. Write an activity to show a freely suspended magnet always aligns itself in a particular direction.

Ans. Activity to show that freely suspended magnet always alignsitself in a particular direction:

Tie a bar magnet at one end of a 25–30 cm long thread and suspend it from a wooden stand. Allow the magnet to come at rest. Meanwhile, mark the directions on a piece of paper and place it on the base of stand, with its centre just below the magnet. Note the direction in which the magnet comes to rest. Now, disturb the magnet and allow it to come to rest again. Again, note the direction in which it aligns itself. Repeat this step many times. The magnet always comes to rest with its poles pointing in the north-south direction.

Q2. How will you magnetise an iron bar?

Ans. An iron bar can be magnetised by following method:

Make the iron bar lie on a table. Hold a bar magnet vertically atone end of the iron bar, so that one of the poles of the magnet (say N-pole) touches the iron bar. Rub the magnet along the length of theiron bar, till you reach its other end. Lift the magnet vertically and bring it back to the previous end such that the same pole touches theiron bar again. Repeat the process at least 40–50 times. The iron bar gets magnetised. It can be tested by bringing small iron pins near it.

Q3. Write some precaustions while handling a magnet.

Ans. Following precautions should be taken while handling a magnet:

1. Never hit or beat a magnet with anything.
2. Do not throw a magnet or let it fall on the floor.
3. Do not heat a magnet.

Q4. Write some uses of magnets.

Ans. Uses of magnets:

1. Magnets are used in pencil boxes, drawers, etc., to ensure proper closing.
2. They are used in fancy stickers and decorations to be fixed on refrigerators and steel almirahs.
3. They are used to separate iron or magnetic substances from nonmagnetic substances in industries.
4. They are used in electric motors, generators, speakers,microphones, etc.
5. Credit, debit and ATM cards have a magnetic strip which contains the necessary information to connect with the account.

Q5. Show with the help of an activity that repulsion is a sure test of magnetism.

Ans. Activity to show that repulsion is the sure test of magnetism: Suspend a bar magnet from a wooden stand. Bring any end of the object to be tested for magnetism, close to both the poles of the suspended magnet, one by one and observe:

If the end of the object is attracted by both the poles, the object isa magnetic substance.

If the end of the object is repelled by one of the poles of the magnet, the object is a magnet.

Skill-Based Questions :

Q1. Why are iron, cobalt and nickel called main magnetic substances?
Ans. Iron, cobalt and nickel are called main magnetic substances because all magnets are made from them or their alloys.

Q2. Why is gold called a nonmagnetic substance?
Ans. Gold is called a nonmagnetic substance because it is not attracted by a magnet.

Q3. What will happen to a magnet if it is broken into pieces?
Ans. If a magnet is broken into pieces, its each piece will behave as an individual magnet having a north pole and a south pole.

L - 16 : AIR AROUND US

Checkpoint 1:

1. Swaying away of clothes and ruffling of our hair make us feel the presence of air.
2. Nitrogen gas, which is 78%, is the largest component of air.
3. Oxygen is 21% of the air.
4. 0.03% carbon dioxide is present in air.

Checkpoint 2:

1. burning 2. burning **3.** 0.03% 4. water vapour 5. oxygen

Checkpoint 3:

1. True 2. True 3. False 4. True 5. False

Let's Drill Our Skills

A) MCQs : 1. oxygen 2. respiration and burning 3. nitrogen - 87%
4. respiration and photosynthesis 5. carbon dioxide

B) Fill in the blanks :
1. nitrogen 2. atmosphere 3. water vapour 4. carbon dioxide
5. dust 6. respiration; burning

C) Define the terms :
1. **Respiration :** Respiration is the process of taking in oxygen by living organisms and combining it with food to release energy and carbon dioxide.
2. **Photosynthesis :** Photosynthesis is the process by which green plants make their food in the presence of sunlight using carbon dioxide and water.
3. **Wind :** The moving air is called wind.

E) Very Short Answer Type Questions :

Q1. Name the second most abundant gas present in the air.
Ans. Oxygen is the second most abundant gas present in air.

Q2. Which gas is used in food packaging to keep the food fresh?
Ans. Nitrogen gas is used in food packaging to keep the food fresh.

Q3. Name the gas aquatic animals take in for respiration dissolved in water.
Ans. Aquatic animals take in oxygen gas dissolved in water for respiration.

Q4. What helps birds to fly?
Ans. Air helps birds to fly.

Q5. In which process does oxygen gas release into the air?
Ans. Oxygen gas is released into air during the process of photosynthesis.

E) Short Answer Type Questions :

Q1. What is the composition of air?
Ans. The air consists of 78% nitrogen, 21% oxygen, 0.03% carbon dioxide, 0.95% noble gases, water vapour, dust particles and smoke.

Q2. Give any three uses of air.
Ans. **Uses of air:**
1. Air helps birds to fly.
2. Air helps aeroplanes, helicopters, etc., to move.
3. Air helps to separate husk from grains by winnowing.

Q3. Give the percentage of the gases oxygen and nitrogen in the air.
Ans. The percentage of oxygen is 21% and that of nitrogen is 78%.

Q4. Why should we breathe through our nose not through our mouth?
Ans. We should breathe through our nose as the fine hair and sticky mucus present inside the nose filter the air. They trap dust particles present in it and do not allow them to enter our body.

Q5. Define photosynthesis. What is its importance?
Ans. Photosynthesis is the process by which green plants make their food in the presence of sunlight using carbon dioxide and water. Photosynthesis is important because it provides oxygen gas for respiration and food to all organisms.

G. Long Answer Type Questions :

Q1. How will you show by an activity that oxygen gas is required for burning?
Ans. Activity to show that oxygen gas is required for burning:
Take a deep bowl and fix a small candle in its centre. Add some coloured water to the bowl. Lit the candle. Invert a glass jar over it. Observe the burning candle and level of water inside the glass jar. The candle extinguishes after burning for some time and the water level rises in the glass jar. This is due to the presence of limited amount of oxygen inside the glass jar which keeps the candle burning till it is used up. The space occupied by oxygen is taken by the water. This is indicated by rise in water level inside the glass jar. This activity shows that oxygen gas is required for burning.

Q2. How will you show that soil contains air?
Ans. The presence of air in soil can be shown by adding water to dry soil. When water is added to dry soil, air comes out in the form of bubbles. The microorganisms, worms, etc., living in soil take this air for respiration. This shows that soil contains air.

Q3. Look at the adjoining figures and answer the questions:
a) Which gas helps the candle in burning - nitrogen, oxygen or carbon-dioxide?
Oxygen

b) Give any one use of this gas, other than burning.
All living organisms use oxygen for respiration.

c) Will the candle continue burning for long? Why or why not?
No, the candle will not continue burning for long as there is limited amount of oxygen inside the glass jar.

d) What causes the water to rise up in the jar?
The space occupied by oxygen is taken up by the water as the oxygen is used up in burning. This raises the water in the jar.

e) What is the name of the main gas left in the jar?
Nitrogen

Skill-Based Questions :

Q1. What do you think is filled in the cylinder which this diver is carrying with? Give reason.
Ans. Oxygen gas is filled in the cylinder. The diver uses this oxygen for respiration inside the water.

Q2. What do you think is filled in the cylinder which an astronaut carries with?
Ans. Oxygen gas is filled in the cylinder an astronaut carries with him.

Q3. Why do we not run out of oxygen?
Ans. We do not run out of oxygen because the oxygen taken for respiration by living beings is continuously replenished by plants by the process of photosynthesis.

L - 17 : DEALING WITH WASTES

Checkpoint 1:

1. biodegradable
2. composting
3. non-biodegradable
4. biodegradable; nonbiodegradable
5. Gaseous

Checkpoint 2:

1. Waste disposal means getting rid of waste in such a way that it causes no or minimum damage to the surroundings and environment.
2. Compostable or biodegradable waste is collected in green bins.
3. Incineration is a waste treatment technology which involves the combustion of waste for recovering energy.
4. The solid waste that is separated from the liquid waste is called sludge.
5. The 3 Rs are Reduce, Reuse and Recycle.

Let's Drill Our Skills

A) MCQs : 1. all of these 2. CNG 3. garbage 4. rotten fruits 5. metallic compounds

B) Fill in the blanks :
1. Compost 2. Septic 3. water 4. CFCs 5. soil

C) Define the terms :
1. **Municipal solid waste :** The solid waste in urban areas managed by municipal authorities is called municipal solid waste.
2. **Solid waste :** The waste in solid form which includes animal and plant waste, discarded metals, plastics, etc., is called solid waste.
3. **Composting :** A biological process by which microorganisms decay the organic matter under controlled conditions and convert it into humus is called composting.
4. **Sludge :** The solid waste separated from the liquid waste during the waste water treatment is called sludge

D) Differentiate between the following :

1. Biodegradable and nonbiodegradable waste

BIODEGRADABLE WASTE	NONBIODEGRADABLE WASTE
The waste which is decomposed by microorganisms into simpler compounds is called biodegradable waste.	The waste which is not decomposed by microorganisms is called nonbiodegradable waste.
e.g. : animal and plant waste, paper, peels of fruits and vegetables, old clothes, etc.	e.g.: metals, detergents, paints, chemical waste, polythene bags, plastics, etc.

2. Open dumping and landfilling

OPEN DUMPING	LANDFILLING
Dumping of solid waste or garbage in an open uncovered area is called open dumping.	dumping of waste outside the city on a piece of land or in a huge ditch which is later compressed, levelled and covered with a layer of soil is called landfilling.

E) Very Short Answer Type Questions :

Q1. Name the process in which the waste material is used again and again.
Ans. The process in which the waste material is used again and again is called reuse.

Q2. Name the worms used for decomposting domestic waste.
Ans. Earthworms are used for decomposing domestic waste.

Q3. Are fallen leaves a biodegradable waste?
Ans. Yes, fallen leaves are biodegradable waste.

Q4. Name the liquid waste obtained from kitchen and toilets.
Ans. The liquid waste obtained from kitchen and toilets is called sewage.

Q5. Name the soild waste obtained from the treatment of liquid waste.
Ans. The solid waste obtained from the treatment of liquid waste is called sludge.

F) Short Answer Type Questions :

Q1. Write short note on liquid waste.
Ans. The waste obtained from various sources in liquid form is called liquid waste. It includes effluents from various industries such as tanneries, distilleries, textiles, chemical and pharmaceutical industries; waste water from kitchens, toilets, etc. The liquid waste is disposed off systematically. It is taken to treatment plant before disposal. In treatment plants, its impurities are removed and the rest part is purified to be used again.

Q2. Enumerate problems caused by the use of plastic objects.
Ans. Plastic is a nonbiodegradable waste, therefore, it accumulates and pollutes the surroundings. It remains unaffected in the soil and causes soil pollution by releasing harmful chemicals into the soil.

Q3. What are environmental hazards of chlorofluorocarbons? What are their sources?
Ans. Chlorofluorocarbons are responsible for the depletion of ozone layer in the atmosphere due to which harmful ultraviolet rays from the sun reach on the earth's surface. These rays cause various skin diseases and cancer. Chlorofluorocarbons are released from refrigerators and air-conditioners.

Q4. Give advantages of composting.
Ans. By composting, organic waste is converted into manure which is used for growing plants. In this way, composting helps to manage waste and provides useful product out of it.

Q5. Name the three Rs that can help in managing wastes?

Ans. The three Rs are Reduce, Reuse and Recycle. By practising threeRs, we can manage our waste with minimum damage to our surroundings and the environment.

Q6. Categorise the biodegradable, nonbiodegradable, recyclable and reusable wastes from the list : Wood pieces, empty ink bottles, broken ceramics, newspapers, earthen pots, rotten fruits, cotton cloth, rusted iron nails

Ans. **Biodegradable waste:** Wood pieces, newspapers, rotten fruits, cotton cloth
Nonbiodegradable waste: Empty ink bottles, broken ceramics,earthen pots, rusted iron nails
Recyclable waste: Empty ink bottles, newspapers
Reusable waste: Empty ink bottles, cotton cloth, newspapers

G. Long Answer Type Questions :

Q1. Explain 3Rs in detail.

Ans. The three Rs are Reduce, Reuse and Recycle. By practising three Rs, we can manage our waste with minimum damage to our surroundings and the environment.
Reduce: We can reduce the amount of waste generated by reducing our level of consumption.
Reuse: We can use some objects again and again and minimise the generation of waste. These objects are metallic utensils, glass vessels, plastic bags, etc.
Recycle: We can make some useful products from waste materials by recycling them. For example, by recycling paper, we get recycled paper which is used for making bags, greeting cards, etc.

Q2. Write some steps that can be taken by individuals to manage the waste.

Ans. Individuals can take following steps to manage the waste:

1. Create less waste by using cloth or jute bag to carry things, and stop using plastic bags.
2. Reuse things as much as possible.
3. Keep separate garbage bins for the segregation of biodegradable and nonbiodegradable wastes.
4. Ensure that the garbage generated in your neighbourhood is collected in the community bins.
5. Never litter the public places.
6. Excreta of pets should be disposed off properly.
7. Set up a central compost pit for composting biodegradable waste.

Q3. Write some methods to manage solid waste.

Ans. Solid waste is disposed off by following methods:

1. **Open dumping:** It is the dumping of waste in an open uncovered area.
2. **Landfilling:** It is the dumping of waste outside the city on a piece of land or in a huge ditch, which is compressed, levelled and covered with a layer of soil.
3. **Composting:** In this method, the organic waste is decomposed by microorganisms and is converted into manure. Composting can be carried out in the presence of air (aerobic method), in theabsence of air (anaerobic method) or by using special earthworms(vermi-composting).
4. **Incineration:** In this method, waste is burnt to ash in controlled conditions.

Q4. How is waste water converted into reusable form?

Ans. The waste water is converted into reusable form by passing it through various stages at water treatment plant as follows:

1. In the first stage, the solid waste is removed from the waste water. This separated solid waste is called sludge which isdecomposed by microorganisms.
2. In the second stage, the liquid part of waste water is aerated and treated with chlorine (chlorination) to make it free from harmful bacteria, toxic chemicals, etc.
3. The purified water, thus obtained, is supplied to the public distribution system.

Skill-Based Questions :

Q1. Rattan's father is a gardener. He avoids to burn the dried leaves of plants. Why?

Ans. The burning of dried leaves causes smoke which pollutes the environment. Therefore, Ratan's father avoids to burn the dried leaves of plants.

Q2. Rehana has just visited Rock Garden in Chandigarh. What message did she get from there?

Ans. Rehana got the message to learn the principle of Reuse from 3 Rs by which waste material can also be utilised for decorative purpose or for making other useful items.

Q3. Why is non-biodegradable waste more hazardous for mankind?

Ans. Non-biodegradable waste is more hazardous because it is not decomposed by microorganisms. Therefore, it gets accumulated and remains unaffected for years in the soil. It spoils the surroundings and causes pollution in the environment.

Q4. Why is the depletion of ozone layer in the atmosphere dangerous?

Ans. The ozone layer in the atmosphere acts as a blanket around the earth saving it from harmful ultraviolet rays coming from the sun. Its depletion will allow ultraviolet rays to come on the earth directly which can cause cancer and many skin diseases to man.