

TEACHER MANUAL

AN ELEMENTARY BOOK OF

SCIENCE

Class 6 to 8

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Book-6

Chapter-1 Sources of Food

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Spices 2. Barley 3. Fox 4. honeybees 5. All of them

B. Fill in the blanks by choose the correct words.

1. Butterfly 2. Herbivores 3. potato 4. hen 5. leafy

C. Write 'T' for true and 'F' false statements :

1. T 2. F 3. T 4. F 5. T

D. Match the column A with column B :

1. hen 2. herbivore 3. milk products 4. carnivores 5. beverage

E. Very short answer questions.

1. We need food for growth and development, and repair of wear and tear of damaged cells.
2. Lion and Wolf are two examples of carnivores. 3. The main sources of food are plants and animals. 5. Coconut is a plant from which edible oil is extracted.

F. Short answer questions.

1. FOOD-A NECESSITY FOR HUMAN LIFE

- To provide energy for various activities of the body.
- For growth and development of the body.
- To protect the body from diseases and keep it healthy.
- For repair of injured body parts.
- For reproduction.

2. Herbivores are plant-eating animals. They have special features that help them to chew and digest plant. 3. The different parts of plants that provide us food are roots, leaves, stems, flowers, fruits and seeds. 4. Cow, goat, buffalo are four animals that give us milk.

G. Long answer questions.

1. All living things need food to remain alive. Animals, including human beings, on the other hand, cannot. They either eat plants or other animals. Animals like a cow (or buffalo), cat, dog, crow, squirrel, goat, lizard and lion eat food. They all eat different kinds of food. 2. We can divide animals into three categories. Herbivores or herbivorous animals. Herbivores are plant-eating animals. They eat grass, leaves and vegetables. Grain-eating birds also come under herbivores. Carnivores are meat-eaters or flesh-eating animals. Some carnivores like snakes, lizards and frogs do not have chewing teeth. They swallow their food as a whole. Animals like bears, foxes, dogs and of course, humans are all omnivores. All omnivores of a species will eat the same kind of food. 3. Do it yourself 4. Cows, buffaloes and goats are some animals which provide us milk. Milk is used to prepare a variety of products like curd, cheese, ghee, butter, cream, etc. Hens and ducks give us eggs. Eggs are not eaten raw. They are used to make cakes and pastries. The main sources of meat are sheep, goat, hen, duck, etc. Fish is a rich source of protein.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 2 Components of Food

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. sugar 2. Vitamin A 3. mineral 4. protein 5. bones and teeth

B. Fill in the blanks by choosing the correct word :

1. carbohydrates 2. rickets 3. iron 4. fats 5. night blindness

C. Write 'T' for true and 'F' for false statements :

1. F 2. F 3. F 4. F 5. T

D. Match the Column A with Column B :

1. prevents constipation 2. Scurvy 3. due to insufficient nourishment 4. due to deficiency of vitamins 5. due to deficiency of both proteins and carbohydrates

E. Very short answer questions :

1. The main carbohydrate that we eat comes from rice, wheat and cereals and is called starch. 2. Sugar and Starch are two sources of carbohydrate. 3. A disease caused by lack of nutrients in diet called deficiency diseases. 4. Vitamin C is present in fruit.

F. Short answer questions :

1. They help our body to remain healthy. All of them have a particular function to perform in the body. We need them in small amounts or traces in our food for proper growth and good health. 2. Water is essential for life. It is needed in the digestion of food, to get rid of waste materials and for many other purposes. Most of the reactions in the body occur in water solutions. About two-thirds of our body weight is due to water. Water is also present in vegetables, fruits, animals and plants. A good example of a fruit is grapes. More than 80% of its weight is water. Dried grapes, what we know as raisins or kishmish, have less water. 3. Material Required : Food sample, mortar and pestle, water, test tube, dropper, copper sulphate solution and sodium hydroxide solution. Procedure : Take a small piece of food item in a mortar. Mash it into a thin paste and add some water to make suspension. Pour 2ml of this suspension in a test tube. With a dropper, add two drops of copper sulphate solution and 10 drops of sodium hydroxide solution (caustic soda) to it. Shake the test tube gently and leave for few minutes. Observation and Conclusion : If the solution becomes purple, the food sample contains protein. If solution remains blue, the food does not contain protein. 4. Fats produce more energy than carbohydrates. To stay healthy, we need to have some fat in our diet. Fats are like an energy bank in living organisms. Many animals such as the bear, whale and walrus store energy in their bodies as fat for future use. Fats are important not only as stored energy but also for the flavour and taste that they give to the food.

G. Long answer questions :

1. Deficiency of iodine causes goitre. In this disease, the thyroid gland becomes enlarged. In our country, people living in hilly regions generally suffer from goitre where the iodine content in the soil and water is low. 2. Do it yourself

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 3 Separation of Substances and Cleaning Food

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. winnowing 2. sieving 3. filter 4. sedimentation 5. distillation

B. Fill in the blanks by choosing the correct word :

1. threshing 2. decantation 3. winnowing 4. sediment 5. distillation

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. F 5. T

D. Match the Column A with Column B :

1. separation of grains and stalks 2. separation of pulses and stones 3. particles are allowed to settle down slowly 4. converting liquid into vapours 5. condensing the vapours

E. Very short answer questions :

1. A pure substance is a substance that contains only one kind of molecules. All particles of a pure substance are alike. Pure substances have a definite composition. 2. Winnowing 3. The process of separating lighter husk from heavier grains. 4. Centrifugation is used in milk dairies to separate cream from milk. Milk is rotated at a high speed in a container. The lighter cream is separated out and floats in the centre.

F. Short answer questions :

1. We need to separate the components of a mixture for the following reasons: To remove undesirable and harmful substances : In grains like wheat, rice and pulses, small stones are present. They can be harmful. So, it is necessary to remove small pieces of stones before milling. To obtain pure substances : Pure substances are required for various uses. So, other substances should be removed to obtain pure substances. To obtain desirable substances : Crude oil is obtained from the Earth. It is a mixture of petrol, diesel, kerosene and natural gas. All these components are very useful. So, crude oil is separated into these components in refineries. 2. The grains separated by threshing need to be winnowed. Winnowing helps the separated of grains from the chaff. In winnowing, the mixture of grain and husk is allowed to fall down vertically and form a heap, while the husk being light, is carried away by wind and forms a heap a little distance away from the heap of grains. 3. This method is used to separate small pebbles which are mixed with seeds is used for sieving grains. The mixture is put into the sieve and rocked or moved about. The smaller particles pass through the holes and fall down. The bigger particles are left in the sieve. The method is commonly employed for separation of wheat flour from the fibrous matter and wheat grains from the impurities due to weeds in the main crop. 4. The mixture of sand and water can be separated by sedimentation and decantation. To do this, allow the mixture to stand in a container for some time. You will see that the sand will settle at the bottom of the container. Pour the top layer of water gently into another container. See that the sand is not disturbed.

G. Long answer questions :

1. Winnowing : The grains separated by threshing need to be winnowed. Winnowing helps the separated of grains from the chaff. In winnowing, the mixture of grain and husk is allowed to fall down from a height. The grains, being heavier, fall down vertically and from a heap, while the husk being light, is carried away by wind and forms a heap a little distance away by wind and forms a heap of grains. 2. Distillation : The process by which a pure liquid is obtained from a solution by evaporating and then condensing the vapour is called distillation. In the process of distillation, a solution is heated till the solvent starts evaporating. This vapour is condensed to give back the pure solvent. The water obtained after distillation from a solution is called distilled water. Distilled water is used in the car laboratory and in car batteries. Water has an ability of dissolving a large number of substances in it. So it is called a universal solvent. 3. Evaporation : Evaporation is the process of converting liquid into its vapour form. Evaporation is used to separate soluble solid particles from a solution. The dry solid particles are left behind when the liquid evaporates. Let us now perform the following activity to separate a mixture of water and salt by evaporation. 4. -?

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 4 Clothing Materials

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Cotton 2. Leather 3. leaves of the mulberry tree 4. ginning 5. retting

B. Fill in the blanks by choosing the correct word :

1. natural 2. stem 3. synthetic 4. alluvial 5. Synthetic

C. Write 'T' for true and 'F' false statements :

1. F 2. T 3. T 4. F 5. T

D. Match the Column A with Column B :

1. fibre not obtained from plant or animal 2. shearing 3. keeps the body cool 4. gunny bags 5. animal fibre

E. Very short answer questions.

1. The fibers that are obtained from plants and animals are called natural fibres. Wool, Cotton are two fibers. 2. In hot humid weather we don't synthetic clothes. 3. Carpats, gunny bags are made from jute fiber.. 4. Those fibers which are made from chemical substances and not obtained from plant and animal sources are called synthetic fibres.

F. Short answer questions.

1. The cotton crop grows best in warm areas with fertile soil and moderate rainfall. The black soil found in southern India and the alluvial soil found in northern India, are ideal for growing of cotton. 2. Weaving is a process of arranging two types of yarn together to get a fabric. Knitting uses a single long yarn interwoven either by hand or machines. 3. This plant is cultivated during the rainy season. It is grown in alluvial soil in the delta regions of rivers like the Ganga and the Brahmaputra. In India, it is mainly grown in West Bengal, Bihar and Assam. 4. Silk thread is obtained from the saliva of an insect called silkworm. It feeds on the leaves of mulberry trees. As it grows into adult, the caterpillar spins a cocoon which is boiled in warm water. This kills the insect and loosens the cocoon. It then becomes easy to separate the silk strand which is spun into a reel. The raw silk is then treated, produced and woven into silk fabric.

G. Long answer questions.

1. Advantages or Merits of synthetic fibre (i) They are strong. (ii) They retain their crease. (iii) They are not attacked by moths and moulds. (iv) They are easy to wash and maintain. (v) They dry up more quickly. (vi) They come in very attractive colours and prints. 2. It is used to make a variety of clothing items like cotton saris, bags, bedsheets, curtains and other upholstery items. Since it is very light and a good absorbent, it is mainly used for making clothes for summer.

- Cotton seeds, left after separation of cotton bolls, are used to produce cotton seed oil. Cotton seed oil is refined and used like other vegetable oils for human consumption.

- The cotton seed meal (khal) now left is used to feed livestock. 3. Jute is known to have a wide range of uses. It is the second most important natural fibre after cotton. Jute is an environment-friendly fibre, as it is completely biodegradable and can be recycled. It is used to make the best quality industrial yarn, fabric, net and sacks. It has good insulating properties. 4. Do it yourself

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself.

Chapter - 5 Grouping Materials of Different Kinds

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. shine 2. three 3. Oil 4. Copper 5. opaque

B. Fill in the blanks by choosing the correct word :

1. steel 2. soluble 3. mercury 4. transparent 5. more

C. Write 'T' for true and 'F' false statements :

1. T 2. F 3. T 4. F 5. T

D. Match the Column A with Column B :

1. miscible liquid 2. soft material 3. hardest substance 4. floats on water 5. magnetic materials

E. Very short answer questions :

1. A shine on the surface of metals. 2. Certain substances dissolve completely in water. Such substances are called soluble substances and this property is called solubility. 3. Sugar, Salt two substances which are soluble and While wax, sand two substances which are insoluble.

F. Short answer questions :

1. The materials which have a special shine are said to be lustrous and the special shine is called lustre. Materials that have such lustre are called metals. Iron, copper, aluminium and gold are some examples of metals. Some materials appear too shiny or are lustrous while others are dull. 2. The mass of a substance per unit volume is called its density. A substance which is denser than water (iron, aluminium), will sink in water. A substance which is less dense than water (wood, cotton), will float and water. 3. The materials, which allow heat energy to flow from one end to another very quickly are called good conductors of heat. The materials which do not easily allow the heat energy to flow through them are called bad conductors of heat. 4. Some materials are attracted towards a magnet. It has been observed that iron, steel cobalt and nickel are attracted towards a magnet. The materials which are attracted towards a magnet are called magnetic materials. The materials which are not attracted towards a magnet are called non-magnetic materials.

G. Long answer questions :

1. PROPERTIES OF MATTER IN THE THREE STATES

Solid state

- Since the molecules in solid state are tightly packed, solids are hard, strong and rigid materials.
- Since the distance between molecules in solids is very small, they cannot be compressed easily.
- Since the molecules in solids do not have a free movement, they cannot flow.

Liquid state

- Since the distance between molecules is larger than in solids, liquids can be compressed a little through not very easily.
- Since the molecules in liquids have an easy movement, they can flow easily.
- Liquids change into gases upon heating, through a process called evaporation.

Gaseous state

- Since the distance between molecules in gases is very large, gases can be compressed easily.
- Since the molecules have free random movement, gases can flow easily in all directions.
- Gases have a natural tendency to intermix. This property is known as diffusion.

2. If you drop an iron nail in water, it will sink. But a piece of wood will float on water. If you take equal volumes of iron, water and wood, you will find that iron is the heaviest and wood is the biggest comparatively. An equal volume of aluminium will be lighter than iron but heavier than water. So, it will sink in water. An equal volume of cotton will be lighter than water. If placed on a wax paper, it will float in water. 3. **Transparency** : When you can see easily through a material

then the material is said to be transparent and this property is called transparency. Light rays pass completely through a transparent medium. Pure water, air, glass, are transparent materials. Anything kept in a transparent material is clearly visible. You can easily see across the window panes of your house. Some of the things made of plastics as bottles and containers which are used in the kitchen, are also transparent. We prefer to keep pulses, spices and other eatables in such containers so that they can be easily located. When the light rays do not pass through a material, it is said to be opaque and this property is called opacity. Solids are generally opaque. For example, metal, wood, stones, etc. are opaque in nature. You cannot see through opaque materials at all.

4. Thus, grouping of objects in a proper way makes it easier to work with them. The process of sorting out and grouping things according to some basis or criteria is called classification.

- Classification of things can be done on the basis of similarities and dissimilarities in their properties. For example, plants and animals are living things. The similarity in them is that they are both made of cells. But there are many dissimilarities too.
- In chapter 4, you learnt that fibres are classified into natural and synthetic fibres, based on their origin.
- Classification of things can be done on the basis of shape also. Things like apples, oranges, footballs, marble balls and rubber balls come under the category or group of round or nearly round objects.
- We can classify things on the basis of size, colour, shape, use and convenience.
- Classification of things can also be done on the basis of materials they are made of. There are things which are made of more than one kind of material. Also, there are different types of things that are made of some other material.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 6 How Things Change

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Rusting of iron **2.** Melting of wax **3.** Irreversible **4.** solids, liquids and gases **5.** Both a & b

B. Fill in the blanks by choosing the correct word :

1. fast **2.** reversible **3.** irreversible **4.** periodic **5.** homogenous

C. Write 'T' for true and 'F' for false statements :

1. F **2.** F **3.** F **4.** F **5.** T

D. Match the column A with column B :

1. fast change **2.** chemical change **3.** periodic change **4.** natural change **5.** non-periodic change

E. Very short answer questions :

1. Melting of ice, germination of seed are slow changes and Burning of paper making of chapatis are fast changes. **2.** The changes which are brought about by nature itself are called natural changes. **3.** Formation of day & night and Earth's rotation are examples of periodic changes. **4.** Solution is a homogenous mixture of one or more substances (the solute) dissolved in another substance (the solvent).

F. Short answer questions :

1. Change is the nature of life. Changes happen around us all the time. Some of these changes can be controlled by us. Others are not in our control. Some changes are slow while others are fast.

Some changes are reversible while other are not. Let us try and group the changes we see around us. **2.** An electric bulb lights up when the switch is turned 'ON'. However, when the switch is turned 'OFF', the bulb also gets 'OFF'. These are all examples of reversible changes. **3.** A chemical change is a permanent change in which an entirely new substance is formed with different properties. **4.** The major component is called solvent and the minor component is called solute. If both the components in a solution are mixed in equal quantity, the term 'solute' can be assigned to either component. A common example would be a solid dissolving into liquid, like salt or sugar dissolving in water.

G. Long answer questions.

1. Classification of changes

Changes can be grouped as follows :

- Slow and fast changes
- Reversible and irreversible changes
- Natural and man-made changes
- Periodic and non-periodic changes
- Physical and chemical changes
- Expansion and contraction

2. To observe a physical change is plasticine.

- Take a ball of plasticine and shape it into a square.
- What do you observe?
- You will observe a physical change in the shape of plasticine from a ball into a square.
- To observe the chemical change in an egg on boiling it.
- Take some water in a pan.
- Put an egg into it and boil it for about 10 to 15 minutes.
- What do you observe?

3. Changes can be brought about by heating or cooling certain substances. Metals like iron, gold and silver soften on heating and can be moulded into different shapes and sizes. Thus, on heating, metals expand and on cooling, they go back to their original sizes. It is a reversible change. This concept is utilized to fix wooden handles into iron blades to make tools which are used to dig the soil and for various other purposes. The iron blade of these tools has a ring, into which the wooden handle is fixed. Normally, the ring is slightly smaller in diameter than the wooden handle. While fixing the handle, the ring is heated. It becomes slightly larger in size, i.e., expansion takes place. The wooden handle is now fixed easily in the ring. On cooling, the ring attains its normal size, i.e., contraction takes place. The wooden handle fits tightly in the ring. Same concept is utilized while fixing a metal rim on a wooden wheel of a cart. Normally, the size of the metal rim is slightly smaller than that of the wooden wheel. **4. Types of solutions** **1. Saturated solutions :** A solution is said to be saturated when the solvent can dissolve no more of a solute at a particular temperature. **2. Unsaturated solutions :** A solution is said to be unsaturated when it is capable of dissolving more of solute than it already contains at the same temperature.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself.

Chapter - 7 Things Around us

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Amoeba 2. Plastic 3. growth 4. stem cutting 5. Respiration

B. Fill in the blanks by choosing the correct word :

1. cell 2. autotrophs 3. latex 4. stomata 5. gills

C. Write 'T' for true and 'F' for false statement :

1. F 2. T 3. F 4. T 5. F

D. Match the Column A with Column B :

1. Unicellular organism 2. Multicellular organism 3. Immediate action in an organism 4. Biotic components of an organism 5. Excretory product

E. Very short answer questions

1. The structural and functional unit of living organism. 2. Amoeba, paramecium, euglena, yeast are four organisms which are made from one all non living things. 3. The fish respire from their gills 4. They move from one place to another in search of food, seeking protection from enemies and natural hazards.

F. Short answer questions.

1. Eating and feeding, Respiration, Growth, Movement, Excretion are common among living. 2. Once a living things has grown, it cannot become small again. So, growth is irreversible in living things. All living things do not grow at the same rate. Some grow fast and some others grow slowly. 3. Elimination of wastes from the body of living organisms is called excretion. Animals excrete wastes from their bodies in the form of urine, stool and sweat. You can observe excretion of waste products in some plants in the form of gum and latex. Latex is a white milk-like fluid excreted by rubber, oak and banyan trees. 4. All living things depend on their surroundings for food, water, and shelter. In other words, all things interact with one another. All things and their interaction make up an environment. The environment of an organism means everything which surrounds it and with which it interacts continuously.

G. Very long answer questions :

1. Growth - All living things show growth. Growth is an increase in the size of an organism. Here are some examples of growth in living organisms.

- A baby grows into a child, a child into a boy or a girl and a boy or a girl into a man or a woman.
- A seedling grows into a tree.
- A chicken grows into a cock or a hen. **Movement** - Movement is also a characteristic feature of living organisms. It is very common in animals. They move from one place to another in search of food, seeking protection from enemies and natural hazards. Movements are less common in plants. Plants move their body parts upwards under the influence of external stimuli like water and light. **Adaptation** - Living organism develops certain characteristics which help it to live and survive in its environment. This is called adaptation. Adaptation is the process by which a living organism learns to survive and reproduce in its environment.

2. Living organism develops certain characteristics which help it to live and survive in its environment. This is called adaptation. Adaptation is the process by which a living organism learns to survive and reproduce in its environment. The following are adaptations shown by different animals.

- A polar bear has a thick fur to help it keep warm in the polar regions.
- A hawk has a sharp and hooked beak for tearing its prey.
- A woodpecker uses its long and pointed beak to drill into the bark of trees to find insects.
- A dog adapts to warm weather by shedding its hair.
- Insect-eating plants grow chiefly in areas where the soil lacks adequate supply of nitrogen. They trap and digest insects in their leaves to fulfill their nutrition requirements.

3. Plants : Green plants are able to make their own food. They are called autotrophs. All green plants have colouring matter called chlorophyll. The green leaves produce food in the presence of sunlight. They use carbon dioxide from the air, and water from the soil. The process of making food by plants is known as photosynthesis. During this process, they give out oxygen gas. This is a unique process that affects environment and life on the Earth. The oxygen released by the plants is given out through the stomata. Since plants can prepare their food themselves, they are also known as producers. **4. (a)** All living things are made of cells. A cell is the smallest unit of living things. Some living organisms are made up of only a single cell. They are called unicellular. Amoeba, paramecium, euglena, bacteria and Yeast are unicellular. Some living organisms are made up of millions of cells. They are called multicellular. All plants, animals and human being are multicellular. **(b)** Stimulus is a change that produces an immediate action (response) in an organism. Response is the immediate action taken by an organism to adjust itself according to the change (stimulus). All living organisms respond to different kinds of stimuli like touch, chemicals, heat, light and smell in different ways. These responses take various forms. Animals show reactions that are visible. For example, a turtle withdraws into a shell on sensing danger and a bacterium swims away from concentration of harmful substances. If you hit an animal, it will try to attack back or run away. Plants respond to many of the same stimuli that effect animals. But the response of plants is usually slower.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 8 The Habitat of the Living

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. hydrophytes 2. Camel 3. Fish 4. Tree 5. Neem tree

B. Fill in the blanks by choosing the correct word :

1. habitat 2. terrestrial 3. Hydrophytes 4. frog 5. green leaf

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. F 5. T

D. Match the Column A with Column B :

1. water 2. cactus 3. sky 4. mango tree 5. frog

E. Very short answer questions.

1. All animals prefer to live in the places where food is available in plenty and which are safe for them and their babies. These places are called habitats. 2. The presence of features or certain habits which help an organism to live in a particular habitat or environment is called adaptation. 3. Habitats are of the following types : 1. Terrestrial Habitat 2. Aquatic Habitat 3. Aerial Habitat 4. Hydrilla, Vallisneria

F. Short answer type questions :

1. This includes habitats of organisms that live and propagate in water. Water absorbs and loses heat gradually, therefore sudden fluctuations in temperature are not found in aquatic habitat. 2. These are the plants which grow in watery places or the places which remain very wet throughout the year. Common hydrophytes are hydrilla, vallisneria, pistia, water hyacinth, lotus, utricularia, etc. **Hydrophytic adaptations** Have poorly developed root system. Root hairs and root cap are absent. 3. Do it yourself 4. Some animals change colour of their skin to blend with their surrounding so that they can escape from their enemies. They are said to be exhibiting protective

colouration. For example, hares and weasels of the far north develop white coat when snow covers their surroundings. A chameleon changes its colour to suit its background. Many desert insects, snakes and lizards are sandy in colour and it becomes very difficult to locate them.

G. Very long answer questions.

1. Terrestrial habitat : This includes habitats of all the organisms which live and propagate on land. The terrestrial habitats have rapid fluctuations in the climate, temperature, moisture, etc. The factors of terrestrial habitat temperature, moisture, etc. The factors of terrestrial habitat vary with the season and the altitude of the region. The terrestrial habitat is not uniform everywhere as several barriers such as desert, mountains, rivers, etc. are found there. **Aquatic habitat :** This includes habitats of organisms that live and propagate in water. Water absorbs and loses heat gradually, therefore sudden fluctuations in temperature are not found in aquatic habitat. **Aerial habitat :** This includes habitat of organisms that use sky for their activities. Birds and bats come under this category. **Arboreal habitat :** Arboreal habitats include habitats on tree. Organisms that live on trees, like monkeys and squirrels are arboreal organisms. **2. Skin :** The skin of animals is adapted to a wide range of temperature to which they are generally exposed. The skin prevents the loss of water from the body protecting it from dryness. Animals like the polar bear, yak, silver, fox, etc. that live in cold regions, usually have thick fur on their skin and also have a layer of fat under their skin. The fur traps air and keeps the body warm. Some animals like lizards and snakes have rough scales and birds have feathers on their skin. These structures protect the skin from dehydration. **Protective colouration :** Some animals change colour of their skin to blend with their surrounding so that they can escape from their enemies. They are said to be exhibiting protective colouration. For example, hares and weasels of the far north develop white coat when snow covers their surroundings. A chameleon changes its colour to suit its background. Many desert insects, snakes and lizards are sandy in colour and it becomes very difficult to locate them. **3.** The organs of movement or locomotion in animals are adapted to their mode of life. Animals like fish that live in water have fins for swimming. A frog has webbed toes which help it to swim in water. The lengthening of the hind limbs and the development of powerful legs have resulted in the frogs leaping movement. They is why a frog can live in water as well as on land. The snakes have no limbs. They move with the help of broad plates on the lower side of their body. Birds have wings to fly with. Camel, the desert ship, has pads on its sole which makes it move on sand without any difficulty. Some mammals have powerful muscles in their legs which help them to run swiftly. **4. (a) Terrestrial habitat :** This includes habitats of all the organisms which live and propagate on land. **Aquatic habitat :** This includes habitats of organisms that live and propagate in water. **(b) Xerophytes :** Those are the plants that grow in deserts or in very dry places where there is scarcity of water. Common xerophytes are cactus, agave, asparagus, euphorbia, yucca, etc. **Hydrophytes :** These are the plants which grow in watery places or the places which remain very wet throughout the year. Common hydrophytes are hydrilla, vallisneria, pistia, water hyacinth, lotus, utricularia, etc.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 9 Plants Forms and Functions

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Mustard 2. Grass 3. lamina 4. leaves 5. cotyledon

B. Fill in the blanks by choosing the correct word :

1. Roots 2. veins 3. pollen 4. pedicel 5. fruit

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. F 4. T 5. F

D. Match the Column A with Column B :

1. fixes the plant to the soil 2. flattened green structure of plant 3. bear leaves, flowers and fruits
4. compound leaf 5. loss of water in vapour

E. Very short answer questions :

1. Plants which climb up with the support of neighbouring structures are called climbers. 2. We grass, turnip had fibrous root. 3. The stem helps to keep the plant upright. The stem and its branches bear the leaves and hold the leaves in such a manner that they get enough light for photosynthesis. 4. The anthers of a flower burst and pollen grains are released. These pollens are transferred from the anthers to the stigma of the same flower or other flowers. This process is called pollination.

F. Short answer questions.

1. Root anchor (fix) the plant to the soil. Roots take in water and minerals from the soil. These are the sent upwards to the parts above the ground. Roots help in holding the soil together. Thus, erosion of soil particles by wind or water is prevented. In some plants, food is stored in the roots. These roots, as in case of carrot, turnip, sweet potato and radish are eaten by us. 2. Vein, tip, petiol, leaf blade. 3. Plants have two types of leaves : Simple leaves, Compound leaves **Simple leaves** : A leaf having a single or undivided lamina is called a simple leaf. It has an axillary bud in its axil. Mango, jamuna and dahlia have simple leaves. **Compound leaves** : A compound leaf is the one in which a number of leaflets are borne on a single stalk. Leaflets do not bear axillary buds in their individual axils. The stalk of a compound leaf is called rachis which has axillary bud. Rose, gram and neem have compound leaves. 4. **Types of flowers** - In most plants, all the four whorls (sepals, petals, stamens, carpels) are present in a flower. Such flowers are called complete flowers. For examples petunia, pea, mustard, hibiscus and gulmohar. In some flowers, one or more whorl is missing. Such flowers are called incomplete flowers. For example maize, date palm and mulberry.

G. Very long answer questions :

1. **Classification of plant** - Now example the different plants closely. Look closely at the stem and branches of :

- Plants much smaller than you.
- Plants that are about your size, and
- Plants which are much taller than you. Based on these characters, most plants can be classified into three categories - herbs, shrubs and trees. **HERBS** - Herbs are small plants with soft and green stem and a life span of few months to one year. E.g. mustard, wheat, maize and coriander. **SHRUBS** - Shrubs are medium-sized woody plants. Their side branches start from just above the ground. They survive for several years e.g. rose, lemon. **TREES** - Trees are tall and large plants with hard and woody stem. They have one main stem called trunk. The branches arise after reaching a certain height. Trees survive for more than ten years e.g. mango, jamun, guava, etc. Look at the stems of moneyplant, mint, gourd, grapevine, pea and cucumber. Are there plants other than herbs. Shrubs and trees? You will find that the stems in these plants are weak. But some of the plants spread on the ground while others climb up with the support of neighbouring structures. Plants that cannot stand upright and spread on the grounds are called creepers, like mint and gourd plants. Plant Which climb up with the support of neighbouring structures are called climbers, like moneyplant and pea plant. Perform activities 9.1 and 9.2 to know about plants on the basis of size. 2. **(a) Root** - Root anchor (fix) the plant to the soil. Roots take in water and minerals from the soil. These are the sent upwards to the parts above the ground. Roots help in holding the soil together. Thus, erosion of soil particles by wind or water is prevented. In some plants, food is stored in the roots. These roots, as in case of carrot,

turnip, sweet potato and radish are eaten by us. **(b) Stem** - The stem helps to keep the plant upright. The stem and its branches bear the leaves and hold the leaves in such a manner that they get enough light for photosynthesis. The stem conducts (transports) water and minerals from the roots to the leaves. It also carries the food manufactured by the leaves to other parts of the plant. When young, the green stem prepares food (photosynthesis). In some cases, stems are modified to store food, as in case of potato, onion, garlic, ginger and turmeric. In cactus, the stem becomes fleshy and green and prepares food for the plant. **(c) Leaf** - The main function of leaves is photosynthesis, i.e., manufacture of food. All green leaves have chlorophyll which taps energy from sunlight and helps in the synthesis of glucose from carbon dioxide and water. Plants give out extra water from the leaves in the form of vapour through stomata. It cools the plant body during hot summer. Stomata are mainly present on the ventral surface of the leaf. In some cases, leaves are modified to store food (as in onion), or reduced to spines to reduce water loss (as in cactus), or modified to trap insects (as in pitcher plant). The leaves of plants breathe in oxygen and breathe out carbon dioxide. However, during the daytime, leaves use carbon dioxide from the air to perform photosynthesis and release oxygen into the atmosphere. **3. (a) Herb** - Herbs are small plants with soft and green stem and a life span of few months to one year. E.g. mustard, wheat, maize and coriander. **Shrub** - Shrubs are medium-sized woody plants. Their side branches start from just above the ground. They survive for several years e.g. rose, lemon. **(b) Creeper** - Plants that cannot stand upright and spread on the grounds are called creepers, like mint and gourd plants. **Climber** - Plant Which climb up with the support of neighbouring structures are called climbers. **(c) Root** - Root system is the underground non-green part of a plant. It consists of primary root and its branches. **Stem** - Shoot system is the aerial part of the plant. It includes main stem, branches, leaves, buds, flowers, fruits and seeds. It develops from the plumule of the seed. **4. Flower** - A flower is the reproductive part of a plant. It helps the plant to produce more its kind. Different flowers have different more its kind. Different flowers have different smells. But there are some flowers which do not have any smell. Flowers may differ in shapes, sizes and colours but all flowers have the same basic parts. Often, each flower has a stalk called pedicel. If the pedicel is absent, the flowers are called sessile. There are some green leaf-like structures in the outermost circle of a flower. These are called sepals. Next to sepals, coloured, bright, showy and attractive leafy structures are present. These are petals. They attract insects and other animals. Stamens are the male parts of a flower. Each stamen has a swollen tip called anther which is present on a stalk called filament. Anthers are filled with pollen grains. In the centre, a flask-shaped carpel is present. It is also called pistil. It is the female part of a flower. Each carpel is divisible into stigma, style and ovary. The ovary contains ovules. On maturity, the anthers of a flower burst and pollen grains are released. These pollens are transferred from the anthers to the stigma of the same flower or other flowers. This process is called pollination. Pollination takes place with the help of wind, water, insects and animals. Most flowers are pollinated by insects. You must have seen insects like butterflies flitting from one flower to another. When they move, they brush against the anthers and pollen grains may stick to their body. As they reach another flower, they transfer the pollen grains to the stigma of that flower. Some flowers are pollinated by wind and some by animals like bat. Once a pollen grain reaches the stigma, it begins to grow a pollen tube. The pollen tube grows down through the style to the ovary. Two male cells travel down each pollen tube. One of them joins with the egg cell (female cell) in the ovule. This fusion of the male cell and the female cell is called fertilization. After fertilization, the ovary grows into a fruit and the ovules develop into seeds.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Chapter - 10 Animals Forms and Functions

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. hinge joint 2. Skull 3. Two 4. fins 5. None of these

B. Fill in the blanks by choosing the correct word :

1. Do it yourself 2. muscles 3. human beings 4. foot 5. birds

C. Write 'T' for true and 'F' for false statements :

1. T 2. T 3. F 4. F 5. T

D. Encircle the odd-one and give reasons :

1. eyes 2. muscles 3. rabbit 4. emu

E. Very short answer questions :

1. The backbone is also called the spine or the vertebral column. It is attached to the skull. 2. Violent muscles, non-violent muscles 3. The backbone is also called the spine or the vertebral column. It is attached to the skull. It is made up of 33 small bones. These are called vertebrae (singular vertebra). The spine forms the central supporting rod for the skeleton. 4. The muscular movement pushes the blood in the direction of body movement. This movement of the blood makes the earthworm move forward.

F. Short answer questions :

1. Muscles have the property of contraction and relaxation. This property of muscles which is responsible for the movement of bones. When muscles make themselves shorter (contract), they pull on the bones and move them. Muscles cannot make themselves longer (relax) again on their own. They need another muscle close by to stretch the first muscle (called the biceps) is called the triceps. 2. **Ball and socket joint** : In this joint, the ball of one bone moves in the socket of the other bone. It allows the bone with ball to move in many directions. This joint is found in our hips and shoulder. 3. Birds can walk on land and swim in water with the help of their legs. But the most striking mode of locomotion in birds is flight in air. But all birds cannot fly. Examples of flightless birds include the ostrich, rhea, emu, kiwi and tinamou. The forelimbs in birds are modified into flight wings. There are special muscles attached to bones that are adapted for flight in birds. Some water birds, e.g. duck, swan, etc. can swim and have webbed feet. 4. Fish swim in water with the help of fins and tails. They gain power for forward moving by swimming their tail fins from side to side while curving the rest of their body alternately to the left and to the right. The vertebral column has to be able to bend, to allow the fish's body to curve like this. Most of the fish have a swim-bladder.

G. Long answer questions.

1. **Human skeletal system** - Human skeleton is formed of 206 bones. Though an infant at birth has 300 bones, some of them fuse as the baby grows and only 206 bones are found in an adult. Skeleton system gives and strength to the body. It also protects the soft, inner organs of the body such as the heart and lungs. As a small child, you have many more bones. But as you grow, some of them join together. From outside, the bones are smooth and hard. However, they are softer and spongy in the inside. The inside portion of a bone is called the bone marrow. It contains living cells and blood vessels. This is the place where the blood cells of your body are made. The skeleton system performs the following main functions : It gives definite shape and strength to the body. It supports the body. It protects the delicate internal organs like brain, heart and lungs of the body. It also keeps the other organs of the body in their proper position. Bones and muscles together produce movements like running and walking. 2. A place where a bone is joined with another bone is called a joint. Joints are held together by strong tissues called ligaments. Different bones in our body are connected to one another by different kinds of joints. When the bones do not move at

the joints like those of the skull, the joint is called an immovable joint. Most joints in our body are capable of movements. That is, the joints are made in a manner to allow movement. Such joints are called movable joints. Movable joints are of the following two types : **Hinge joint** : The joint allows movement in one direction only, similar to the hinges of a door. Joints at the elbow, knee, toe and finger are hinge joints. **Ball and socket joint** : In this joint, the ball of one bone moves in the socket of the other bone. It allows the bone with ball to move in many directions. This joint is found in our hips and shoulder. **3. Exoskeleton** - The skeleton present on the body surface (outside) is called exoskeleton. It is formed of non living substances. It occurs in the form of scales in fish, epidermal scales and bony scales in reptiles, wings, feathers and claws in birds and hair, nails, claws and hooves in mammals. **Endoskeleton** - The hard skeletal framework inside the body is called endoskeleton. It is formed of cartilages or bones or both. In sharks, the endoskeleton is cartilaginous. In bony fishes and frogs, the endoskeleton comprises both of cartilages and bones. In birds and mammals, endoskeleton is bony. Cartilage is found mainly at the joints, to absorb shock and to reduce friction between the bones. **4. a. Snail** - A snail moves with the help of muscular organ called the foot which produces a slimy fluid called mucus. When the snail has to move, the foot comes out of the shell through an opening. The foot now produces mucus. The mucus provides a smooth surface to the snail to walk. The foot then produces a series of wave-like movements. These movements of foot help the animal to move forward. **b. Snake** - The body of a snake curves into many loops. Each loop of the snake gives it a forward push by pressing against the ground. Since its long body makes many loops and each loop gives it this push, the snake moves forward very fast and not in a straight line. Snake uses its head and tail as support and lifts its trunk sideways.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 11 Motion and Measurement of Distances

Let Us Answer

A. Multiple choice questions (MCQs) :

1. length 2. meter 3. periodic 4. rotatory 5. vibratory

B. Fill in the blanks by choosing the correct word :

1. James watt 2. meters 3. rectilinear 4. rest 5. Oscillatory motion

C. Write 'T' for true or 'F' for false statement :

1. F 2. T 3. F 4. T 5. T

D. Match the column A with column B :

1. moving boats in a boat race 2. motion of spinning wheel 3. pendulum of clock 4. string of guitar is plucked 5. swinging of our arms

E. Very short answer questions.

1. Measurement is the comparison of an unknown quantity with a fixed and known quantity of the same kind. This known fixed quantity is called unit. 2. 6000 meters in 6 Km. 3. A man walking on the road, a girl playing in a playground, a bus moving on a road, the moving pendulum of a wall clock, all are terms of motion. 4. Rectilinear motion, Circular motion, Oscillatory motion Vibratory motion are four types of motion.

F. Short answer questions.

1. Long ago, many of the units of length were derived from the length of some parts of the human body. For example, a pace or a footstep, a cubit (the distance from the elbow to the tip of the

middle finger), hand span, and width of the fingers were used as units of measurement of length. But these vary from person to person. **2.** This leads to confusion in measurements. Therefore, there is a need for some standard units of measurement that does not change from person to person. Different standard units measurement were created at different places. For the sake of uniformity, scientists all over the world have accepted a set of standard units of measurements. This standard system of unit is known as the International System is Units, i.e., SI units. **3. (a)** Non- Periodic motion **(b)** Rectilinear motion **(c)** Non-Periodic motion **(d)** Periodic motion **4.** An object is said to be at rest if it does not change its position with respect to a fixed point in its surroundings. For example, a book lying on a table, if not disturbed by anybody, does not change its position with respect to the table. So, the book is said to be in a state of rest. Similarly, the walls of a room are also at rest. We see human beings, other animals and objects moving from one place to another. For example, a man walking on the road, a girl playing in a playground, a bus moving on a road, the moving pendulum of a wall clock, all are in motion. These examples show that one thing is common to every moving object; that is, it keeps changing its position continuously. An object is said to be in motion if it changes its position with respect to a fixed point in its surroundings.

G. Long answer questions :

1. Width, depth, thickness, distance and height are all measurements of length. The ruler and metre scale are used for use for measuring lengths. Suppose we want to measure the length of a glass slab. The 0-mark on the ruler is made to coincide with one end of the slab. The reading at the other end of the slab gives its length. Commonly used measuring tools for length are meter scale or meter ruler, meter rod and measuring tape. You keep a 15 cm scale in your geometry box. A cloth merchant uses a meter rod for measuring the length of the cloth. A tailor uses a measuring tape to take measurements for stitching your clothes. **2. Rectilinear Motion :** An object is said to be in linear or rectilinear motion, if it moves from one position to another along straight line in one direction only. The motion of vehicles on a straight road, the march past of the soldiers in a parade and the falling of a stone or fruit from a tree are examples of rectilinear motion. Some other examples of rectilinear motion are boats moving in a boat race, that of runners in a 100 metre race, motion of striker in the game of carrom and a rolling ball after a powerful shot by a batsman. In all these examples, the objects move in a straight line. **3. (a) Rectilinear Motion :** An object is said to be in linear or rectilinear motion, if it moves from one position to another along straight line in one direction only. The motion of vehicles on a straight road, the march past of the soldiers in a parade and the falling of a stone or fruit from a tree are examples of rectilinear motion. **Rotational Motion :** When some objects move in a circle, their motion is called rotational or circular motion. The motion of the blades of an electric fan, the motion of a child sitting on a ferris wheel, are examples of rotational motion. **(b) Periodic Motion :** When an object repeats its motion after a fixed interval of time, the motion is called periodic motion. The motion of swinging pendulum of a wall clock is an example of periodic motion. The earth rotates about its axis in 24 hours, causing day and night. The moon moves around the earth in about a month's time and the earth moves round the sun in about 365 days. In all these movements, the objects like the moon and the earth repeat their motion after a fixed time-interval. So, these are periodic motions. **Non-periodic Motion :** When the object repeats its motion but not in fixed intervals of time, the motion is called non-periodic motion. The swinging of our arms or legs and the expansion of our lungs during breathing are repetitive but not after fixed intervals of time; so these are non-periodic motions.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 12 Electric Current and Circuits

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. closed circuit 2. solar cell 3. Electric switch 4. Wood 5. None of these

B. Fill in the blanks by choosing the correct word :

1. bad 2. switch 3. dry cells 4. sunlight 5. volts

C. Write 'T' for true or 'F' for false statements :

1. F 2. F 3. T 4. F 5. T

D. Match the column A with column B :

1. electricity is produced from the chemicals inside 2. electricity device 3. source of energy 4. allow electric current to pass 5. used to break circuits

E. Very short answer questions :

1. The chemicals inside the cells are used, they can be recharged using electricity. Such cells are used in mobile phone, car batteries, laptops, cameras, etc. 2. Electric current is the flow of electricity. 3. When a circuit with breaks Than we can say electric circuit is closed.. 4. Those materials which do not allow electric current to flow through them are called insulators.

F. Short answer questions :

1. Solar cell : Cells that convert solar radiation into electricity. Solar cells are used in calculators, satellites, telescopes, traffic signals etc. A solar vehicle is an electric vehicle powered by solar electricity which uses solar cells. Solar cells are also used in the form of panels on the roofs of houses as a source of energy for generating electricity or heating. **2. Conductors and Insulators -** In our daily life, we notice that some substances allow electricity to flow through them but some do not. Those materials which allow electric current to flow through them are called conductors and those materials which do not allow electric current to flow through them are called insulators. **3. Switch :** We use a switch for allowing or stopping electricity from flowing through an electric circuit. A switch has two terminals, to which wires can be connected. When the switch is turned off, a metal strip moves away, opening the circuit at the terminals. Switches are available in various shapes, sizes and current-carrying capacities. **4.** A person gets an electric current flows through his or her body. A severe shock can cause internal burns, and might even be fatal.

G. Long answer questions :

1. Electric cell - An electric cell is a device which is used to generate electricity. A cell has two terminals, a positive terminal and a negative terminal. Chemicals are present inside the cell which react with each other and produce electricity. Types of cells They are three types of cells **Dry cells** : These cells stop producing electricity when the chemicals inside the cell are completely used up. Such cells are used in torch, clocks, toys or transistors. It has two terminals or connection points, marked '+' and '-'. When these two terminals are connected by a metal wire, an electric charge begins is flow through the wire constituting an electric circuit. A city cell is made with zinc and carbon. **Rechargeable cell :** As the name suggests, once the chemicals inside the cells are used, they can be recharged using electricity. Such cells are used in mobile phone, car batteries, laptops, cameras, etc. **2.** The higher the voltage of a battery, the brighter the bulb will glow when it is connected to it. A battery used chemicals to make electricity. When these chemicals are used up, the battery stops working. If you look carefully at a battery, you will see that there is a plus sign (+) at one end and a minus sign (-) at the other end. These ends are called the terminals. We write them as positive (+) and negative (-). **3.** When the bulb is put in a circuit, one lead must touch the bottom of the bulb and the other lead must touch the metal casing. To light a bulb you need a battery and some wires. They must be connected in the right way to make a complete circuit. If you

connect the wires to opposite ends of the battery the bulb will still light up. Remove the bulb from its holder. The bulb will go out because no electricity is passing through it. Remove one of the wire from the battery. The same thing will happen-the bulb would not light up. **4.** Given below are some preventive measures that can be taken to be safe from electric shocks : Do not pull a wire from the plug joint. Do not take out the wire when the switch is on. Try to remain away from electric poles and transformers on the road. Do not fly a kite near electric poles and cables. Do not touch a hanging wire on the road, even if it is a TV cable wire or a telephone wire. It could be carrying an electric current, or be in contact with such a wire. Do not insert your finger into a plug socket. You might get a nasty shock. Do not plug in or take out the cords of any electrical appliances with wet hands.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 13 Magnets

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Rubber **2.** magnetic field **3.** Magnetic compass **4.** Both a & b **5.** Plastic cover

B. Fill in the blanks by choosing the correct word :

1. repel **2.** high **3.** N-S **4.** non-magnetic **5.** poles

C. Write 'T' for true and 'F' for false statements :

1. T **2.** T **3.** F **4.** F **5.** T

D. Match the column A with column B :

1. demagnetization **2.** artificial magnet **3.** helps to find direction **4.** ends of magnet **5.** non-magnetic material

E. Very short answer questions :

1. A substance that has the property of attracting iron is called a magnet. **2.** Like poles, Unlike poles are two types of magnet. **3.** It attracts small pieces of iron towards it. It always comes to rest in the north-south direction when suspended freely. **4.** Telephones, television, doorbell.

F. Short answer questions.

1. Any material that behaves like lodestone, i.e. attracts iron and aligns in the N-S direction when suspended, is a magnet. While lodestone is a natural magnet, the magnets around you are made artificially from a variety of materials. **2.** A magnetic compass is a device which is used to find the direction. It is a circular aluminium box with a magnetic needle which rotates freely on a pivot in the centre of the box. On the base of the box, directions like north, south, east, west, north-east, south-east, etc. are marked. The magnetic needle always rests in the north-south directions. **3.** A magnet which is made artificially from iron, steel, cobalt, etc. and has high magnetic power, is called an artificial magnet. **4. Demagnetization** - Magnets have a tendency to lose their magnetism. This is called demagnetization. A magnet can lose its magnetism if it : is heated, is hammered, or, Falls from a height. Magnets also lose their magnetism if they are not stored properly. To keep them safe, bar magnets should be kept in pairs with their unlike poles on the same side. They must be separated by a piece of wood while two pieces of soft iron should be placed across their ends. For a horseshoe magnet. One should keep a piece of iron, called a keeper, across the poles.

G. Long answer questions :

1. It is said that once upon a time, in Greece, there lived a shepherd. His name was Magnes. He used to take his herd of sheep and goats to the nearby mountains for grazing. He carried a stick with an iron tip at one end. One day he rested the iron mounted end of a stick on a stone. As soon as the stick touched it, it got stuck to the stone. The stone was a natural magnet and it attracted the iron tip of the shepherd's stick. This was how the natural magnet was discovered. Perhaps, based on the name of the shepherd, that stone was given the name magnetite. **2.** When two magnets are brought near each other they are either pulled towards each other or pushed away from each other. This pulling of magnets is called attraction of other or pushed away from each other is called repulsion of magnets. The repulsion or attraction of magnets depends on the fact that which poles of magnets are facing each other. Like poles of magnets (N-N or S-S) repel each other, while unlike poles (N-S or S-N) attract each other. **3.** Magnetic and non-magnetic materials - Materials that are attracted by a magnet are called magnetic material. Iron, nickel, cobalt, steel and their alloys are magnetic materials. Materials that are not attracted by a magnet are called non-magnetic materials. Aluminium, copper, stones, chinaware, glass, paper, brass, wood, plastic, etc., are non-magnetic materials. **4. (a) Poles of magnet** - A magnet pulls or attracts things made of magnetic material. So, a magnet exerts a force on them. This force is called the magnetic force. If iron filings are brought close to a bar magnet, you will observe that most of the iron filings cling to the two ends of the magnet whereas very few filing cling to the central part of the magnet, which indicates that these ends of a magnet have a strong force of attraction than the other parts of the magnet. The two ends of the magnet, which have strong magnetic force are called the poles of the magnet. **(b) Permanent magnet** - Any material that behaves like lodestone, i.e. attracts iron and aligns in the N-S direction when suspended, is a magnet. While lodestone is a natural magnet, the magnets around you are made artificially from a variety of materials. These magnets show magnetic properties unless they are severely damaged. They are, therefore, called permanent magnets. Permanent magnets come in various shapes and sizes. The most common one is the bar magnet. A horseshoe magnet is made from a bar bent in the shape of U. Magnets in the shape of cylinder, dumbbell, discs and rings are also available.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 14 Rain, Thunder and Lightning

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Three-fourth **2.** none of these **3.** in hot and warm condition **4.** all of these **5.** None of these

B. Fill in the blanks by choosing the correct word :

1. living being **2.** clouds **3.** flood **4.** oceans **5.** rainfall

C. Write 'T' for true and 'F' for false statements :

1. T **2.** T **3.** T **4.** F **5.** F

D. Match the Column A with Column B :

1. steam **2.** floods **3.** storing rainwater in tanks **4.** rain **5.** fast vaporization

E. Very short answer questions.

1. Solid, liquid and gaseous are three states of water. **2.** The process of conversion of a solid into its liquid state occurs at a fixed temperature, called melting point. **3.** The process of conversion of a liquid into its gaseous state is called vaporization. **4.** The water level of lakes, ponds and rivers to rise, leading to a condition called flood.

F. Short answer questions.

1. To another by change of state of water with temperature. **2.** When the temperature of air increases, it expands (i.e. its particles move away from one another). This makes the air lighter and it rises in the atmosphere, taking water vapour with it. Water vapour is formed when water bodies evaporates due to the heat of sun. As the air rises, it begins to cool. The water vapour condenses on dust particles present in the atmosphere to form millions of tiny droplets. Tiny ice crystals could also form if it is very cold. This cluster of tiny water droplets floating in air and appear as cloud.

- **3.** The crop-yield becomes less. The soil dries up as it continues to lose water by evaporation.
- Lack of water may cause death of livestock.
- Water shortage may cause death of people living in drought area.
- Food and fodder become scarce. It may lead to malnutrition.

Dehydration and other related diseases are common during drought. **4.** Thunder and lightning occur during heavy rainfall. They occur when there is a heavy flow of electric charges either between two clouds or between a cloud and a tall tree or building.

G. Long answer questions :

1. The continuous circulation of water from the Earth's surface to the air and from the air back to the Earth's surface is called water cycle. The water in seas, rivers, lakes, ponds or streams evaporates because of the heat of the sun. Plants also give out large amounts of water from their leaves. The water vapour rise up. The air higher up in the atmosphere is cooler. This cools the water vapour and it condenses to form tiny drops of water. Many such tiny drops of water together form clouds. As the clouds get cooled further, the water drops become bigger. When they become too heavy, they fall on the Earth as rain. This is called precipitation. Sometimes, when it is very cold, the water drops may freeze and fall as hail or snow. **2. Conservation of water -** Conservation of water means to save water. We must use water very carefully and avoid wasting it. Some of the ways by which we can conserve water are :

- Use minimum amount of water for bathing. Use a bucket instead of a shower. Never throw the water away when there may be another use for it. You can reuse the water (used for washing vegetables, etc.) for watering plants.
- Do not let water run while brushing, shaving or washing your hands or face. Make sure that your house has no leaky taps.
- Avoid flushing the toilets unnecessarily. A lot of water is wasted in this process.
- Turn off the taps immediately after use.
- Adopt rainwater harvesting. **3. Rainwater harvesting -** The process of collecting and storing rainwater from the rooftop of building is called rainwater harvesting. It is a very good method of increasing the availability of water. The water is generally stored in tanks or is directed to the ground. **4. a. Evaporation -** Evaporation is a slow conversion of water into its vapour state. Boiling is a fast conversion of water into its vapour state. Evaporation is faster in hot and warm conditions. During daytime, the air surrounding us also gets heated. Therefore, evaporation takes place in the shade also. **Condensation -** The process of conversion of gas or vapour into its liquid state is called condensation. Condensation takes place at a particular temperature called condensation point. **b. Flood -** Most of the rainfall in our country occurs in the monsoon season. The amount of rainfall varies from one place to place. In some places, it rains throughout the year, while some other places experience very little rainfall. But, if it rains heavily, it may cause the water level of lakes, ponds and rivers to rise, leading to a condition called flood. **Drought -** If it does not rain in particular region for a long time, it may lead to a condition called drought. A drought is an extended period of months or years when a region does not receive any rainfall. A drought can cause a lot of damage and harm to life.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 15 Light

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Star 2. straight line 3. Transparent 4. None of these 5. real

B. Fill in the blanks by choosing the correct word :

1. sun 2. Transparent 3. Luminous 4. straight 5. real

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. T 5. T

D. Match the Column A with Column B :

1. shadow 2. reflection 3. natural source of light 4. not received on the screen 5. when light strikes on a rough surface

E. Very short answer question.

1. Light is a form of energy which sensitises our eyes and enables us to see the objects around us.

2. Sun, Moon, Stars, Glow-Worm (Jugnu) are four natural sources of light. 3. Property of light is used in the working of a pinhole camera is that light travels in straight line. 4. An opaque object casts a dark shadow, a translucent object casts a faint shadow and a transparent object casts no shadow at all.

F. Short answer questions :

1. Those bodies which give out light energy of their own are called luminous bodies. Objects such as the sun, a burning candle and an electric bulb, are some common examples of luminous bodies.

2. A shadow is the darkness that an object causes when it prevents light from falling on another objects. It is only a dark region which does not contain any colour. The size of the shadow is relative to the position of the object with respect to the source of light. We usually see the shadows of plants, animals and other objects everywhere in the daytime. Your own body casts a shadow on a sunny day. When we stand in sunlight in the morning, our shadow on the ground is longer as compared to that formed around noon time. It again becomes longer in the evening. 3. **Regular reflection** : When a parallel beam of light falls on a smooth and polished surface, then the reflected rays also are a parallel beam of light. This is regular reflection. **Irregular reflection** : When a parallel beam of light strikes a rough surface, it is reflected in different directions. Such a reflection is called irregular reflection. 4. Do it yourself

G. Long answer questions :

1. Transparent objects allow light to pass through them fully. Glass, air and water are transparent objects. Translucent objects allow light to pass through them only partially. Oily or butter paper, muddy water and smoked glass are translucent objects. Opaque objects do not allow any light to pass through them. Wood, wall, book and some plastics are opaque objects.

2. Properties of Shadows

- A shadow is formed only when the light is blocked by an opaque object.
- A shadow is only a dark region, which does not show any colour or the details of the object.
- A shadow may or may not resemble the actual shape of the object.
- The shadow can be formed only on a screen.
- The size of shadow is relative to the position of the light source with respect to object.

3. Laws of reflection - The behaviour of light rays during the course of reflection is defined by the following laws : First law of reflection : The angle of incidence $\angle i$ is equal to the angle of reflection $\angle r$. **Second law of reflection** : The incident ray, the reflected ray and the normal to the reflecting surface at the point of incidence, all lie in the same plane. The laws of reflection are applicable to all polished and smooth surface whether plane or curved. **4. (a) reflection of light** - The phenomenon of change in direction of light after striking a polished surface in a well-defined manner, is called reflection. The phenomenon of bouncing back of light from the surface of an object is called reflection. **(b) image** - An image that can be captured on a screen is called a real image. An image which cannot be captured on a screen is called a virtual image. **(c) mirror** - A mirror is a smooth polished surface which can change the direction of light.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 16 Air Around Us

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. it has mass and it occupies space 2. respiration and burning 3. Oxygen 4. Both a & b 5. All of these

B. Fill in the blanks by choosing the correct word :

1. atmosphere 2. nitrogen 3. carbon dioxide 4. oxygen 5. dispersal

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. F 5. T

D. Match the Column A with Column B :

1. envelope of air 2. 78 % 3. helps in burning 4. gaseous form of water 5. photosynthesis

E. Very short questions :

1. The air called matter because of it has mass and it occupies space. 2. N, O, Ar, CO₂, H₂, He etc. 3. Carbon dioxide and water produced during the process of photosynthesis. 4. Oxygen

F. Short answer questions :

1. The various components of air and their percentage in air by volume are as follows :

S.No.	Gas	Proportion (Percentage by volume)
1.	Nitrogen	78.084 %
2.	Oxygen	20.946 %
3.	Argon	0.934 %
4.	Carbon dioxide	0.033 %
5.	Other gases like hydrogen, helium, neon, methane, etc.	In traces
6.	Water vapour	variable
7.	Dust and smoke particles	variable

2. Some living organisms living under the soil make deep burrows and holes in the soil through which the air reaches them for respiration. You must have seen that after rains, the earthworms come out of the soil. This is because the rainwater fills the burrows made by them. Thus, in order to respire, they come above the surface of soil. **3.** This experiment shows that water animals also use oxygen dissolved in water. **4. Uses of air - 1.** Air is required by human beings for respiration. **2.** Air supports burning. No substance can burn in the absence of oxygen. Oxygen is necessary for the burning of all substances like wood, coal, paper, etc. **3.** While winnowing, the breeze or the moving air helps to blow away the lighter husk and, thus, helps to separate it from the grains. **4.** Air helps in drying agricultural products such as grains, pulses, dry fruits, etc. Things dry faster in wind. **5.** Air helps in pollination of flowers. Air helps in the dispersal of seeds and fruits.

G. Long answer questions :

1. Air is colourless, odourless and tasteless mixture of gases. Because of this, we can't see it. You can feel the presence of air when the leaves of tree rustle. Also, the clothes hanging on a cloth-line sway when air is moving or when you switch on the fan. Your hair and pages of books, newspapers and magazines start fluttering. Also, you inflate air in the tyre of your bicycle. You can fly a kite in the sky because of the moving air. There is air all around Earth. The envelope of air around Earth is called atmosphere. **2.** Air supports burning. No substance can burn in the absence of oxygen. Oxygen is necessary for the burning of all substances like wood, coal, paper, etc. **3.** Take some water in a transparent glass bowl or a beaker. Heat it slowly on a tripod stand. Look at the inner surface of the glass vessel or beaker. You will notice tiny bubbles on the inner surface of the glass vessel or beaker. These are the air bubbles containing oxygen. This experiment shows that water animals also use oxygen dissolved in water. **4.** Oxygen is used by living organisms for respiration. During respiration, oxygen breaks down the food to give energy. During this process, carbon dioxide and water vapour are produced and given out. Carbon dioxide along with water is used by the green plants in the presence of sunlight to make their own food. This process is called photosynthesis. In nature, the balance of oxygen and carbon dioxide is thus maintained.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 17 Dealing with Waste

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Metals **2.** domestic waste **3.** None of these **4.** solid disposal **5.** All of these

B. Fill in the blanks by choosing the correct word :

1. discarded **2.** agriculture waste **3.** community work **4.** blue pins

C. Write 'T' for true and 'F' for false statements :

1. F **2.** T **3.** F **4.** F **5.** T

D. Match the Column A with Column B :

1. smoke and dust **2.** decomposed very quickly **3.** chemical waste **4.** waste spread on a plain **5.** sewage

E. Very short answer questions :

1. The food we eat or water we drink generate waste in the form of excreta and urine. Each household generates a large amount of waste every day in the kitchen, bathroom, etc. **2.** Animal excreta, Animal body Parts are agricultural waste. **3.** The solid waste is ground or smashed in special machines to convert them into small pieces. This is called pulverization. **4.** Pathogenic

waste include disease-causing micro-organisms such as bacteria, fungi and viruses that are found commonly in sewage, hospital wastes and run-off water from farms.

F. Short answer questions :

1. Waste in liquid form is called liquid waste. We generate lots of liquid waste through our domestic activities like washing and bathing. Fertilizer industries, distilleries and tanneries are the principal generators of liquid wastes. Water running out of industries often contains various types of liquid wastes. **2.** The solid waste is often dumped in low-lying areas outside the city called landfills. The garbage is dumped into the landfill and finally covered with soil. **3.** All wastes generated from non-living matter are called non-biodegradable wastes. It includes chemical wastes, detergents, paints, varnishes and the most problematic polythene bags. Metals, metallic compounds, glass, mercury, lead, tin, etc. are also non-biodegradable waste. **4.** Given below are benefits of recycling : **1.** It helps to conserve natural resources such as wood, water and animals. **2.** It saves energy because less energy is used to manufacture brand new products. **3.** Recycling programs cost lesser than waste disposal programs. **4.** It can give employment to many people. **5.** It saves land used for landfilling.

G. Long answer questions :

1. Classification of wastes - Waste can be classified on the following bases. **Impact of waste on human health** : non-toxic, toxic and pathogenic waste. **Decaying nature of waste** : biodegradable and nonbiodegradable waste. **Non-toxic, toxic and pathogenic wastes** : Non-toxic waste are not harmful to human beings, plants, animals and their environment. Most domestic waste is non-toxic. Toxic or hazardous wastes are harmful and create health problems in man and domestic animals. They spoil the environment also. Industrial waste, biomedical waste and electronic waste are usually toxic. They pollute air, water and soil. Pathogenic waste include disease-causing micro-organisms such as bacteria, fungi and viruses that are found commonly in sewage, hospital wastes and run-off water from farms. **Biodegradable and non-biodegradable wastes** : Biodegradable waste means organic substances from plants and animals which are decomposed by microorganisms (bacteria and fungi) into simpler compounds. On decomposition, this waste produces compound which is used as manure for crops. **2. (a) Non-toxic waste** - Non-toxic waste are not harmful to human beings, plants, animals and their environment. Most domestic waste is non-toxic. **(b) Pathogenic waste** - Pathogenic waste include disease-causing micro-organisms such as bacteria, fungi and viruses that are found commonly in sewage, hospital wastes and run-off water from farms. **(c) Industrial waste** - The industrial waste includes coal ash, furnace slag, metallic scrap, acids, oils, paper scrap, alkali, acids, bleaching powder, etc. **3. Methods of solid waste disposal** : Physical removal of solid wastes involves normal activities like : **Collection of solid waste** - Sorting out decomposable, non-decomposable and reusable materials from the heap of solid waste. Solid wastes are collected often along roadsides where people throw away wastes of their homes. Municipalities in small towns and Municipal Corporations in big cities place big bins for the collection of solid wastes along roadsides. Trucks and trolleys of municipal bodies collect waste accumulated at different places and dump them on some suitable and safe site, located far from human habitation. The solid waste is ground or smashed in special machines to convert them into small pieces. This is called pulverization. The volume of solid waste is reduced through pulverization and it becomes easy to handle, transport and dispose the pulverized waste. The pulverized solid waste is often spread on a plain and hard surface; then it is pressed by a bulldozer. This is called compaction. The solid waste is often dumped in low-lying areas outside the city called landfills. The garbage is dumped into the landfill and finally covered with soil. Wastes are also burnt in special furnaces called incinerators to reduce its volume. **4.** Sewage is treated through the following four step process : The sewage is sent through settling chambers where lime is mixed with it. Thus, it becomes neutralized and most of its sediments are removed. The neutralized sewage is passed through an Upflow Anaerobic Sludge Blanket (UASB). Here, the decomposable matter of sewage is decomposed through bacterial activities in the absence of oxygen. After that, the waste is passed

through aeration tanks where air and bacteria are mixed to it. In this step, dissolved substances, fine particles and bacteria are removed by various processes like mixing of chlorine, evaporation exchange and absorption. The treated water is then released into a river or it is utilized in different activities.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Periodic Assessment - I

Do it yourself

Half-Yearly Examination

Do it yourself

Periodic Assessment - II

Do it yourself

Final Examination

Do it yourself

Book-7

Chapter - 1 Nutrition in Plants

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. All of these 2. autotrophs 3. chlorophyll 4. symbiotic plants 5. Mushroom

B. Fill in the blanks :

1. nutrition 2. heterotrophs 3. saprophytic plants 4. chlorophyll 5. oxygen

C. Match the column A with column B :

1. insectivorous plant 2. symbiotic plant 3. parasitic plant 4. saprophytic plant 5. prepare their own food

D. Write 'T' for true and 'F' for false statement :

1. T 2. F 3. T 4. T 5. F

E. Very short answer questions :

1. The body of living organisms is made up of tiny units called cells. Cells are too small to be seen with naked eyes. 2. CO_2 , water, light, Chlorophyll are required for photosynthesis. 3. The process of taking in food and its utilization by the body is called nutrition. 4. Pitcher plant, Venus flytrap are insect eating plants..

F. Short answer questions :

1. They prepare their own food. 2. Presence of small pores generally on the lower surface. Through these pores, carbon dioxide enters the leaf. These pores are called stomata. 3. Do it yourself 4. The hollow leaves of pitcher plant are filled with a fluid which the insects come to drink. When an insect sits on the pitcher, the lid gets closed and the insect is drowned and eaten by the pitcher plant.

E. Long answer questions :

1. Light, coming from the sun. The process of preparing food using carbon dioxide and water in the presence of chlorophyll and light is known as photosynthesis. The leaves absorb sun's energy and store it in the form of food. 2. Plants need a variety of minerals and elements for carrying out life functions. These are absorbed from the soil by the root system and carried to the stems, branches and leaves. The mineral sources are air, soil and water. Mineral salts are dissolved in water and are taken up. Plants use minerals in a number of ways. They become constituents of protoplasm and cell wall, e.g., nitrogen and sulphur in proteins, magnesium in chlorophyll and calcium in the cell wall. 3. The mode of nutrition in which an organism prepares its own food from simple substances is called autotrophic nutrition, and the organisms which obtain food by this mode are called autotrophs. The mode of nutrition in which an organism obtains food from other organisms is called heterotrophic nutrition. The organisms which obtain food this way are called heterotrophs. They get their food either from plants or animals. All the animals are heterotrophs. 4. In lichens also, symbiotic relationship is seen. There is an association between a green alga and a non-green fungus. The fungus provides shelter, water and minerals to the alga. The alga, in return, provides food to the fungus. The alga, being green, prepares food by photosynthesis.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 2 Nutrition in Animals

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. both a & b 2. assimilation 3. the presence of villi 4. large intestine 5. anus

B. Fill in the blanks :

1. feeding tube 2. intracellular 3. toffees, chocolates 4. Pharynx 5. four Chambers

C. Match the column A and column B :

1. absorption of water 2. gall bladder 3. epiglottis 4. storage of undigested food material 5. cow

D. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. T 4. T 5. F

E. Very short answer questions :

1. Mostly animals, thus, consume solid organic matter as their food. Such type of nutrition in which food is eaten in solid form is called holozoic nutrition. 2. roundworm, pinworm are parasitic animal. 3. 20 milk teeth, 32 permanent teeth are in human. 4. The mouth contains the tongue, teeth and salivary glands. The process of digestion starts in the mouth itself. The teeth cut and chew the food and grind it. This is called mechanical digestion of food. The salivary glands produce saliva which begins the digestion of food in the mouth. This is the chemical digestion of food.

F. Short answer questions :

1. Digestion is the process of breaking down of complex food molecules into simpler molecules and it is brought about with the help of special molecules called enzymes. Enzymes break down food particles into simpler molecules through chemical reactions. 2. Its food consists of microscopic organisms. On sensing food, amoeba puts out pseudopodia which surround the food particle and ultimately, takes the food particle inside the body. The food particle inside the amoeba forms a food vacuole. Digestion of the food particle is a chemical process and is performed by digestive juices (called enzymes). Enzymes are released from the food vacuole which break down the food; digest and assimilate it. Once the nutrients have been absorbed, the waste is thrown out. It then forms a vacuole around the waste and pushes it out of the body. 3. Pharynx opens into oesophagus which runs along the neck and the chest. Food from pharynx enters the oesophagus. Due to the wave-like movements of the food pipe, food is pushed downwards towards the stomach. Actually this type of movement takes place in the whole of the alimentary canal which pushes the food downwards. This wave-like movement is termed as peristalsis. 4. **Absorption in Small Intestine** - The inner walls of small intestine have millions of finger-like outgrowths called villi (singular-villus). These villi greatly increase the absorptive area of the intestine. These have large number of blood vessels near their surface. Now the digested food in its simple form passes through the walls of intestine and enters the blood. This process is known as absorption.

G. Long answer questions :

1. (i) In simple organisms like amoeba, food particles are taken in with the help of pseudopodia. Pseudopodia are formed at any point of the cell surface where the presence of food is experienced. (ii) In hydra, the prey is paralysed and taken inside the body with the help of tentacles. (iii) In case of cockroach, the food is taken inside the body with the help of specially formed mouth parts. (iv) Mosquitoes suck the blood of animals with the help of their feeding tubes. (v) Butterflies have a coiled mouth (proboscis). When it feeds, proboscis unwinds to a straight tube. The butterfly sucks nectar with the help of this tube only. (vi) A starfish feeds on animals covered by hard shells. After opening the shell, starfish pops out its stomach through its mouth to eat the animal. It then withdraws its stomach back into the body and then the food is digested slowly. (vii) The frog catches its food with the help of its tongue. (viii) Elephant holds the food with its trunk and puts it into its mouth. (ix) Birds take in food with the help of their beaks and claws. (x) Human beings, squirrels, etc. hold the food with their forelimbs and then put it into their mouths. Thus, organisms have specific ways of capturing and taking in food. 2. **Absorption in Small Intestine** - The inner walls of small intestine have millions of finger-like outgrowths called villi (singular-villus).

These villi greatly increase the absorptive area of the intestine. These have large number of blood vessels near their surface. Now the digested food in its simple form passes through the walls of intestine and enters the blood. This process is known as absorption. The blood takes these absorbed substances to various body organs where they are used to build complex substances like proteins required for the growth and repair of the body. This is called assimilation. The blood takes these absorbed substances to various body organs where they are used to build complex substances like proteins required for the growth and repair of the body. This is called assimilation. The glucose in cells is used to obtain energy. This energy is used to carry out various life processes. The food that remains undigested passes into the large intestine. **3. Ruminants** are hooved, plant-eating animals which digest their food in two steps. Some examples are cows, buffaloes, goats, sheep and bison. They have complicated stomach consisting of four chambers. Food that is swallowed goes into the first chamber called the rumen. Here, it is partially digested and is called cud. It then goes to the second chamber from where it is returned to the mouth for thorough chewing. This process is called rumination. That is why these animals are called ruminants. After chewing, the food is swallowed for a second time and then digested further in the remaining two chambers. It is finally sent to the small intestine, where the absorption of the nutrients occurs. **4. (a) Pancreas** - It is a cream-coloured gland present just below the stomach. It secretes digestive juice called pancreatic juice. **(b) Liver** - The liver is the largest gland of the body. Its weight is about 1.5 kilogram and is brown in colour. Just beneath the liver is present a structure called gall bladder. Liver secretes bile juice of green colour. This bile juice is collected in the gall bladder. It comes into the gall bladder through the bile duct. It does not have any digestive juice in itself but it plays an important role in digestion of fats. It breaks down large fat droplets into tiny droplets so that digestive enzymes can act on them easily. It also makes the food alkaline so that pancreatic juice (secreted by pancreas) can act on it. **(c) Tongue** - Tongue, a fleshy muscular organ, is attached at the back and free at the front. It can be moved in all directions.

- It performs the following functions : It mixes the food with saliva so that the enzymes, present in saliva, can act on it.
- It helps in swallowing the food.
- It helps us to taste food.
- It helps us to speak.
- The tongue recognizes four different tastes - sweet, salty, bitter and sour, due to the presence of tiny structures called taste buds on its surface.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 3 Fibre to Fabric

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. scouring 2. Sheep 3. sorting 4. China 5. Silkworm

B. Fill in the blanks :

1. Sheep 2. Burrs 3. Shooody 4. White worms 5. throwing

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. T 5. F

D. Match the column 'A' with column 'B'.

1. the hair on the skin of sheep 2. removal of fleece 3. rearing of silkworm for obtaining silk 4. give strength to raw silk 5. applied to silk yarn before it is woven.

E. Very short answer Questions :

1. Lohi, Bakhrawal obtaining wool. 2. Now the fine quality long fibres are separated from those of inferior quality. This process is known as sorting. 3. The raw silk is now much stronger than it was when it left the cocoon. 4. Silk fabric is lightweight, lustrous, soft, elastic and strong. It stays warm in winter and cool in summer. Silk is commonly used for making expensive dresses for men and women, which are worn on special occasions.

F. Short answer questions :

1. The sheared fleece (or fibres) contains dust, grease, sweat, dirt, etc. Hence, it is washed thoroughly with water and detergent. The process of removal of these impurities is called scouring. It is done by washing fleece in soapy water in a tank. Now-a-days machines are used for scouring. 2. The fleece is removed along with thin layer of skin, usually with mechanical shears and in one piece. Now-a-days, electricity driven shearing machines are also used. The fleece is generally shorn once yearly, in the spring or the early summer. In the regions where the climate is warm throughout the year, shearing is done twice a year. 3. Silkworm now changes into a pupa which is the third state of its life cycle. If permitted to live, the pupa becomes a moth in about three weeks, thus completing the life cycle. When a pupa changes into a moth, it bursts the cocoon and breaks the long silk thread into many short ones.

4. USES of Wool

- Wool is used for making fabrics, shawls, blankets, carpets, felt (compressed wool) and upholstery.
- Wool felt is used to cover piano hammers. It is also used to absorb noise in heavy machinery and stereo speakers.
- Shoddy is made from the used wool. To make shoddy, the existing wool fabric is cut into small pieces and then carded. The carded wool is then respun into yarn. Such a yarn is inferior to the fresh wool and is used for making cheap woollen garments and blankets.

F. Long answer questions :

1. Shearing of Fleece : The fleece is removed along with thin layer of skin, usually with mechanical shears, and in one piece. Now-a-days, electricity driven shearing machines are also used. The fleece is generally shorn once yearly, in the spring or the early summer. In the regions where the climate is warm throughout the year, shearing is done twice a year. Wool from different parts of the same fleece varies greatly in length of fibre, fineness and structure. Wool from the shoulders and sides of the sheep is usually superior to that from other parts of the body. **Scouring :** The sheared fleece (or fibres) contains dust, grease, sweat, dirt, etc. Hence, it is washed thoroughly with water and detergent. The process of removal of these impurities is called scouring. It is done by washing fleece in soapy water in a tank. Now-a-days machines are used for scouring. The grease that is removed is considered a valuable byproduct. It is used in creams, soaps, lotions, cosmetics and ointments. **Sorting :** Now the fine quality long fibres are separated from those of inferior quality. This process is known as sorting. The fibres are sorted on the basis of their fineness, length, colour, etc. **Removing burr :** Burrs are soft fluffy fibres in wool (similar to those that often appear on sweaters you wear). These are removed manually. 2. Some health risks are also associated with wool industry. Workers involved in wool production spend a lot of their time with sheep. Many a time, sheep kicks them. Sometimes, male sheep or rams but into workers. In this way, workers often get muscular and skeletal injuries. Sheep may be infected with a bacterium, anthrax. The infection can spread from sheep to workers handling infected sheep or from their infected wool. The infection causes a fatal blood disease called sorter's disease in humans. 3. Female silk moth is larger in size than the male silk moth. It lays hundreds of eggs on the underside of fresh mulberry leaves which stick to it, because of some gummy material sticking to them. In due course of time, these eggs hatch to form white larva, commonly known as

silkworm or caterpillar. they eat mulberry leaves for 4 to 6 weeks and grow in size. Silkworm now changes into a pupa which is the third stage of its life cycle. If permitted to live, the pupa becomes a moth in about three weeks, thus completing the life cycle. When a pupa changes into a moth, it bursts the cocoon and breaks the long silk thread into many short ones.. For this reason, silk farmers allow only a small percentage of pupas to develop into moths. These moths are kept to lay the next batch of eggs. To save silk, the other insects are killed before they break their covering. Silk farmers usually kill the insects by placing the cocoons in boiling water. **4. (a) Boiling and Reeling :** After sorting the cocoons, the initial step in the harvesting of silk fibre is to kill the insect inside the cocoon. For killing the cocoons are boiled in water. The boiling hot water not only kills the insects within the cocoon, but dissolves the gummy substance that holds the cocoon filament in place. The cocoons are then dried and brushed to remove coarse outer portion which consists of coarse filaments. After brushing, filaments from four to eight cocoons are joined and twisted. They are then combined with a number of other similarly twisted filaments, to make a thread that is wound on a reel. **(b) Throwing :** The raw silk is now much stronger than it was when it left the cocoon. But it is still not strong enough to be woven into anything except the sheerest material. It is strengthened by a process called throwing, which involves twisting and doubling it to the required strength and thickness. **(c) Weaving :** Silk yarns are woven on looms much like those used for cotton and wool. Automatic power looms have replaced hand-weaving methods in almost all the countries. Many silk fabrics, including damasks and heavy evening wear fabrics, are woven on jacquard looms. Beautiful designs or patterns can be woven on these looms.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself.

Chapter - 4 Heat and Temperature

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. All of these 2. 37 °C 3. conduction 4. None of these 5. None of these

B. Fill in the blanks.

1. Celsius scale 2. contraction, expansion 3. 110 °F degree 4. conduction, convection 5. vacuum or thermos

C. Match the column 'A' with column 'B' :

1. mercury 2. bad conductors of heat 3. application of convection 4. radiate more heat 5. Celsius

D. Write 'T' for true and 'F' for false statement :

1. T 2. T 3. F 4. F 5. T

E. Very short answer questions :

1. The heat is transferred from the warmer object to the colder object. 2. 36.9°C is the normal temperature of human being in Celsius scale. 3. Celsius scale is used to measure temperature. 4. The Fahrenheit has 5 divisions

F. Short answer questions :

- 1. Mercury is an opaque, shiny, silvery liquid. It can easily be seen through the glass.
- It has a uniform rate of contraction and expansion.
- It does not stick to the glass tube.
- It is a good conductor of heat.

- It has a low freezing point (-39 C) and high boiling point (357 C). Thus, it can be used over a wide range of temperature.
- It has a very low specific heat capacity.

2. Recautions to be observed while using a laboratory thermometer :

- The thermometer should be washed before and after use.
- A thermometer is delicate and should be handled with care to avoid breakage.
- It should not be held by the bulb while reading the temperature.
- It should be kept upright and not tilted.
- The bulb should be completely surrounded by the substance whose temperature is being measured, and the bulb should not touch the sides of the container.
- while reading the thermometer, the level of mercury should be at the same level as the eye.

3. In solids, heat travels only by the process of conduction. The process of transfer of heat energy in solid without the actual movement of particles from their position is called conduction. **4.** Dark coloured dresses are suitable in winter because they absorb most of radiant heat of the sun.

G. Long answer questions :

1. Do it yourself **2. Sea and Land Breezes :** In the day time, the land near the sea is very hot as compared to sea water. So, the air above the land becomes warmer and lighter and rises up and the cold air from the sea blows towards the land to acquire its place. This is called the sea breeze. Water cools down slowly as compared to land. Hence at night, the air above sea is comparatively hot as compared to that above the land. Therefore, the air from the land flows towards the sea. It is called the land breeze. **3.** Do it yourself **4.** The heat from the sun reaches us even though is very far away from the earth. This is possible through radiation. Radiation is the process of heat transfer from a hot body to a colder body without heating the space between the two. Heat energy that flows from a hot body to a cold body without heating the space (medium) in between is called radiant heat or thermal radiation. Thus, radiant heat travels in straight lines in all directions from the source. It does not require a medium to flow through. It does not hat the medium through which it passes.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 5 Acids, Bases and Salts

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Tastes sour **2.** base **3.** Baking soda **4.** Litmus **5.** yellow

B. Fill in the blanks :

1. Citric acid **2.** Bases **3.** indicator **4.** hydrochloric acid **5.** acids

C. Write 'T' for true and 'F' for false statements :

1. T **2.** F **3.** F **4.** T **5.** T

D. Match the column 'A' with column 'B' :

1. found in grapes **2.** bases which are soluble in water **3.** used for purification of water **4.** turmeric
5. change to yellow in base solution

E. Very short answer questions :

1. Nitric Acid (HNO_3), Sulphuric acid (H_2SO_4) are two mineral acids. **2.** Acetic acid found in Vinegar. **3.** Bases turn red litmus solution blue. **4.** China rose, Turmeric are natural indicators.

F. Short answer questions :

1. Sulphuric acid (H_2SO_4) is called king of chemicals because it is used in the manufacture of many chemicals. It has an oily appearance, so it is also called oil of vitriol. It is used in car and inverter batteries, in the manufacture of paints, drugs, dyes, artificial silk and fertilizers. **2.** Burning of fuels like coal, wood, petrol, diesel, etc. in homes and automobiles produces carbon dioxide, sulphur dioxide and nitrogen oxides as air pollutants. These pollutants enter the air and dissolve on the rain drops to form carbonic acid, sulphuric acid and nitric acid respectively. The rain having these acids in it is called acid rain. Acid rain can damage monuments, buildings, plants and animals. **3.** When an acid reacts with a base, salt is formed. Acid + Base salt + water This reaction between acid and base is called neutralization reaction. For example : $\text{NaOH} + \text{HCl} = \text{NaCl} + \text{H}_2\text{O}$ (strong) (strong) (neutral) (water) (base) (acid) (salt) **4.** It is not possible to taste each and every substance to identify its chemical nature. Also, it may be dangerous to touch each and every substance. To overcome this problem, special types of substances called indicators are used to get to know the chemical nature of substances.

G. Long answer questions :

1. Uses of Mineral Acids - (i) Hydrochloric acid (HCl) is used to remove deposits from inside boilers. This is called descaling. It is also used for cleaning the surface of metal. It helps in the purification of common salt and used for preparing dyes, glue, etc. **(ii)** Sulphuric acid (H_2SO_4) is called king of chemicals because it is used in the manufacture of many chemicals. It has an oily appearance, so it is also called oil of vitriol. It is used in car and inverter batteries, in the manufacture of paints, drugs, dyes, artificial silk and fertilizers. **(iii)** Nitric acid (HNO_3) is used to manufacture fertilizers such as ammonium nitrate. It is also used in the manufacture of explosives such as TNT (trinitrotoluene) and nitroglycerine, for cleaning gold and silver ornaments by goldsmiths. **Uses of other Acids - (i)** Acetic acid (vinegar) CH_3COOH is used for pickling of many food items because many microorganisms do not grow in acidic environment. **(ii)** Carbonic acid is used in soft drinks along with sugar and citric acid. **2.** Substances like soaps, baking soda, detergents and shampoos which are bitter in taste and soapy to touch are called bases. These substances are said to be basic. Generally whenever you have acidity in stomach, you are advised to take an antacid (base) which helps to neutralise the acidity in your stomach. Several antacids contain the base magnesium hydroxide or aluminium hydroxide. Magnesium hydroxide and aluminium hydroxide are mild bases. Calcium hydroxide is a strong base. Sodium hydroxide and potassium hydroxide, from which soap is made, are also strong bases.

Properties of Bases

- All bases are bitter in taste and soapy to touch.
- Bases turn red litmus solution blue.
- Bases in their aqueous solution are good conductors of electricity.
- They react with acids to form a salt and water. This is called neutralization.
- Strong bases like sodium hydroxide are extremely corrosive in nature. On coming in contact with the skin, they produce painful blisters. **3. Indicators -** It is not possible to taste each and every substance to identify its chemical nature. Also, it may be dangerous to touch each and every substance. To overcome this problem, special types of substances called indicators are used to get to know the chemical nature of substances. **Litmus as Indicator -** The most common natural indicator used in the laboratory is the litmus. It is extracted from lichens and absorbed on to filter paper. It is available in two colours, red and blue. It changes its colour depending upon whether the compound is an acid or a base. Blue litmus paper turns red in acids and red litmus paper turns blue in bases. Litmus is available in solution form also. **Turmeric As Indicator -** Turmeric is a yellow spice which adds colour to your curries. You must have seen it in your kitchen. It is also a natural indicator. Acids and neutral solutions do

not affect turmeric but bases turn it red. **4.** You have learnt that substances which are neither acidic nor basic in nature are called neutral substances. The reaction between an acid and a base is called neutralization reaction. Acid + Base _____ Salt + Water + Heat An acid neutralizes the effect of a base neutralizes the effect of an acid. **In Agriculture :** Plants grow best in neutral soil. The plants growing in acidic or basic soils have low yield. Excessive use of fertilizers and acid rain can make the soil acidic. Such soils are treated with bases like calcium hydroxide (slaked lime) or calcium oxide (quick lime). These bases neutralize the acidity of soil. Similarly, basic soils are treated with compost (decaying organic matter). Acids released by manure makes the basic soil neutral. **Disposal of Factory Wastes :** The wastes of many factories contain acids. If they are allowed to flow into water bodies, the acids will kill fish and other organisms. The factory wastes are, therefore, neutralized by adding basic substances.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself.

Chapter - 6 Physical and Chemical Changes

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. reversible change 2. physical change 3. chemical change 4. both a & b 5. pure substance

B. Fill in the blanks :

1. Physical changes 2. Ripening of fruit, Rusting of iron 3. Oxygen, Water 4. rust 5. Crystallization

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. T 4. F 5. T

D. Match the column 'A' with column 'B' :

1. glowing of an electric bulb 2. souring of milk 3. prevented by painting 4. produced by chemical change 5. used to obtain pure substance

E. Very short answer questions :

1. Dissolution of resin in alcohol. Evaporation of water from lakes, rivers and seas are examples of physical change. 2. A change in which the substance can never be formed in previous form. 3. A change in which one or more new substances with entirely different properties (from those of original substances) are formed is called a chemical change. 4. No new substance is formed during a physical change. Identity of original substance is not lost.

F. Short answer questions :

1. The differences between physical and chemical changes are given in table below :

S.No.	Physical Change	Chemical change
1.	The change in which no new substance is formed after a process is called physical change.	1. The change in which a new substance is formed which shows new set of properties as compared to the original substance is called chemical change
2.	These are temporary changes.	2. These are permanent changes.
3.	They are reversible.	3. They are irreversible.
4.	Very little energy is absorbed or evolved during these changes.	4. Large amount of energy is absorbed or evolved during these changes.
5.	E.g., Reactants Products	5. E.g., Reactants _____ Products

2. The properties of a substance such as shape, size, colour, texture, etc. are called its physical properties. A change in which only physical properties of a substance are altered and no new substance is formed is called a physical change. **3.** Rusting is a very slow process but still it is harmful as it eats away metal. The rust formed on the surface of iron is light and porous and is in the form of flakes. The flakes gradually break off thereby exposing the lower metal which now starts rusting. In this way the metal weakens. **4.** Larger crystals of pure substances can be obtained from their solutions by a process called crystallization.

G. Long answer questions :

1. Characteristics of Physical Changes - Based on the observations/conclusions of activities, we can say that characteristics of physical changes are as follows :

- Only the physical properties of substances (colour, size, shape, state, etc.) change during a physical change.
- No new substance is formed during a physical change.
- Identity of original substance is not lost.
- Physical changes are usually temporary.
- Very less amount of energy is absorbed or given out during these changes.
- Physical changes are usually reversible. The changes get reversed as soon as the cause of change is reversed.

Characteristics of Chemical Changes - The characteristics of chemical changes are as follows :

- Identity of original substance is lost.
- One or more new substances with entirely new properties are formed.
- These changes are usually permanent and irreversible.
- Large amount of energy is associated with these changes.

2. To show a Physical change with the help of a salt solution.

- Take some water in beaker.
- Dissolve a spoonful of salt into it. What do you get?
- You will get a solution of salt and water.
- Now heat this solution over a burner for sometime. What do you observe?
- You will observe that slowly the water evaporates and salt is left at the bottom. What do you get?
- You will be able to get back salt. Therefore, it is a physical change.

3. Rusting of iron can be prevented in many ways : Applying Oils or Grease : Oil or grease applied on the surface of iron objects prevents them from coming in contact with water and air, thus preventing them from rusting. **Painting** : Various iron articles like furniture, bridges and railway coaches are painted to protect them from rusting. Paint prevents their surface from coming in contact with moisture and air. Thus they do not get rusted. **Galvanizing** : The process of depositing a thin layer of zinc on iron object to prevent it from rusting is called galvanization. Iron sheets are dipped in molten zinc and then cooled to get galvanised iron sheets. Since zinc is not affected by air and moisture, iron is prevented from rusting. These galvanised iron sheets are used for making drums, buckets, dustbins, etc. The iron pipes used in houses are also galvanised to prevent rusting. **Electroplating** : When the surface of a metal is coated with other rust resistant metal by using electric current, it is called electroplating. Generally, iron articles are coated with nickel and chromium metals. The layer of chromium or nickel acts as a barrier between object and atmosphere (air and moisture) and thus prevents object from rusting. **By alloying** : The substance formed by mixing a metal with another metal or non-metal is called an alloy and the

process is called alloying. Iron when mixed with carbon and other metals like chromium, nickel and manganese forms stainless steel, an alloy. Stainless steel does not rust in moist air. It is used for making knives, cooking utensils, etc.

4. To prepare copper sulphate crystals.

- Take some distilled water in a beaker.
- Add 2-3 drops of dilute sulphuric acid to it.
- Heat it over a burner.
- When it starts boiling, add a small amount of copper sulphate powder to it.
- Stir it continuously to dissolve.
- Continue adding copper sulphate powder till no more powder can be dissolved.
- Carefully filter the hot solution.
- Leave it undisturbed overnight.
- What do you observe?

Shiny crystals of copper sulphate are observed. If you do not see the crystals, leave the beaker for some more time. As the time passes by the crystals become larger. Separate the crystals from solution by filtration. You have obtained pure large crystals of copper sulphate.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 7 Weather, Climate and Adaptations of Animals to Climate

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Moon 2. climate 3. rain gauge 4. fatty tissue 5. very cold

B. Fill in the blanks :

1. Humidity 2. clouds 3. sun 4. blubber 5. hot, humid

C. Write 'T' for true and 'F' for false statements :

1. F 2. F 3. T 4. F 5. T

D. Match the column 'A' with column 'B' :

1. barometer 2. flightless bird 3. migratory bird 4. camouflage 5. long tail

E. Very short answer questions :

1. Rain gauge is used for measure the rainfall.. 2. Hygrometer is used for humidity place measurement. 3. The ability to adjust to one's surrounding called adaption. 4. Lion tailed elephant, lived in tropical forests.

F. Short answer questions :

1. The weather pattern of a place can be seen from the weather records of the past several years. The average weather pattern of a place taken over a long time, say 25 years is called the climate of that place. 2. If winds are moisture-laden, then they will cause rain but if they lack moisture, the region they will pass through will remain dry. Winds coming from seas contain moisture but as they pass, they lose their moisture as rain, etc. and finally become dry. 3. If you read the newspaper daily, you may have seen the weather report printed in it. If you look at it carefully, you will find that it gives the following information. Maximum and minimum temperature of the past 24 hours. Humidity / relative humidity. Rainfall. Times of sunrise and sunset. Prediction of weather for the present day.

4. The various adaptations of polar bear are as follows :

- The polar bear has white thick fur which makes it almost invisible in the white snowy background. The fur thus not only protects it from its enemies but also helps it to catch its prey.
- It has two thick layers of fur. The fur traps air which is a bad conductor of heat. Thus fur protects its body heat from escaping to surroundings thereby keeping it warm.
- It has a layer of fat called blubber under its skin. Fat also acts as an insulator. It thus keeps the body heat in and the animals feels warm.

G. Long answer questions :

1. ELEMENTS OF WEATHER - Temperature - The degree of hotness or coldness of a body is called its temperature. Sun heats the surface of the earth and causes its temperature to rise. The heat of the sun that reaches the earth is affected by clouds, winds, etc. Hence, the temperature of a place also varies from time to time. The lowest temperature of a place during a day is called the minimum temperature while the highest temperature of a place during a day is called the maximum temperature of that place for that day. The maximum and minimum temperatures are recorded by special thermometers called maximum and minimum thermometers. **Humidity** : Humidity is yet another important element of weather. Water vapours are always present in air. Therefore, humidity is the amount of water vapour present in the air. High humidity can make us uncomfortable as it prevents evaporation of body sweat and we feel sticky and uncomfortable. Humidity is measured by an instrument called hygrometer. **Rainfall or Snow fall** : Water evaporates from earth's surface and forms clouds. When the water droplets in the clouds become so heavy that they can no more float in air, they fall down to the earth as rain. When the temperature of atmosphere is below freezing point of water, these droplets may come down to the earth in the form of snow, hail, etc. Rainfall is measured by a rain gauge. **Wind Speed** : Moving air is called wind. There are two factors of wind which influence weather. One is wind speed and another is wind direction. Wind speed tells about how fast is the wind blowing. It can be measured by an Anemometer. The wind direction indicates that where the wind is blowing. It is measured by a Wind Vane. **Pressure** : It is the weight of air resting on earth's surface. The differences in atmospheric pressures can cause winds. Some of these winds can also cause rainfall. It is usually measured by a barometer. **2. Weather** - The day to day condition of the atmosphere at a place with respect to the temperature, humidity, rainfall, wind speed, etc. is called the weather at that place. Thus, we see that weather of a place is not determined by a single factor. Various factors like temperature, humidity, rainfall, wind, etc. are called the elements of the weather. **Climate** - The weather pattern of a place can be seen from the weather records of the past several years. The average weather pattern of a place taken over a long time, say 25 years is called the climate of that place. **3. The factors that determine the climate of a place are as follows :** **Latitude, i.e. Distance from Equator** : The places near the equator are hot while those away from equator are cold. This is because sun's rays are vertical at equator and become more and more slanting as we move away from equator. Vertical rays have more heating effect as compared to slanting rays. **Altitude (Height above sea Level)** : The places at higher altitudes have cold climates as compared to those present at sea level. Now you can easily understand why places on mountains like Jammu and Kashmir have cold climate. **High Mountains** : High mountains can block the path of winds and if these winds are moisture-laden they cause rains thereby affecting climate. **Distance from sea** : Places near the sea have moderate climate (neither cold nor hot).

4. (a) Adaptation of Camels

- It has a brown coloured body which matches well with the surroundings.
- It has long eyelashes which protect the eyes during sand storms.
- It can close its nostrils to prevent sand from entering the nasal cavity.
- The hump of a camel stores fats and helps the animal to survive without food for several months.
- The animal can drink over 40 litres of water at a time and this water is stored for later use.

- It has thick lips which help it to eat prickly desert plants like cacti without hurting itself.
- It has well-padded wide feet which enable it to walk on hot sand.

(b) Adaptations in Penguins - Penguins are a group of aquatic flightless birds living mostly exclusively in the southern hemisphere. They spend about half of their time on land and half in the oceans. The various adaptations of penguins are as follows :

- Penguin is white in colour. It, therefore, merges well with its background.
- Its black back helps to absorb heat during daytime thereby warming it.
- It has a thick skin and a lot of fat which keeps it warm by preventing body heat loss.
- They huddle together to keep themselves warm.
- The bodies of penguins are streamlined and their feet are webbed. Both these characteristics make them good swimmers.

(c) Adaptations in Red-eyed Frog - Red eyed frogs, as their name states, are green frogs having red eyes. They spend a majority of their life in trees which also makes them great jumpers, they have developed sticky pads on their feet to help them climb trees. They rely on camouflage to protect themselves. During the day, they remain motionless and tuck their bright feet under their stomach and shut their red eyes. Thus, they appear green and lie well-hidden among the leaves.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 8 Soil

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. weathering 2. four layers 3. clay 4. Deforestation 5. afforestation

B. Fill in the blanks :

1. humus, minerals 2. plants 3. fertile 4. soil particles 5. dams

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. F 4. T 5. F

D. Match the column A with column B :

1. breaking of rocks into soil 2. growing plants 3. various layers of soil 4. cutting of trees 5. high humus content

E. Very short answer questions :

1. Soil is a mixture of several substances. 2. Horizon A or topsoil is rich in humus. 3. Clayey soil is best for growing paddy. 4. Sandy soil known as sand soil.

F. Short answer questions :

1. Soil is formed by the breaking down of rocks by various agents like wind, water, etc. This process of breaking of rocks into fine particles of soil is called weathering. 2. Vertical section of the soil showing its different layers or horizons is called soil profile. 3. Indiscriminate cutting of trees is called deforestation. The root system of trees binds the soil together. In deforested / barren areas, water flows at a very high speed. Water does not seep down in soil in such areas. Hence, water carries away soil particles with it and deposits them in river which ultimately carries them to oceans. Forests reduce the speed of wind and thus prevents soil from being blown away. In deforested areas, the soil particles are easily blown away by wind. 4. In terrace farming, terraces are cut into the hillside, keeping the slope from the edge of terrace towards the hill-side. Farming

is done on these terraces. Water flows slowly through these terraces. A lot of water also goes down into the soil.

G. Long answer questions :

1. Composition of Soil - Soil is a mixture of several substances. The constituents of soil are both living and non-living. The major constituents of soil are as follows : **Soil Particles** : Soil mainly contains of soil and rock particles. The sizes of these particles may vary depending on the type of soil. The size of soil particles determine the texture of soil. **Humus** : Humus is formed from the remains of dead and decaying plants and animals. Microorganisms help in this process of decay. It is a source of nutrients and makes the soil fertile. **Soil water** : Soil contains water between its particles. This water also contains various minerals dissolved in it. It is this water only which is absorbed by the roots of plants. **Soil Air** : Air is also present between the soil particles. Roots of plants utilize this air for the process of respiration. This air is also used by living organisms of soil. **Soil Organisms** - Soil organisms consists of earthworms, insects, snails, bacteria and fungi. Many of these help in improving the soil fertility. Bacteria and fungi help in the decomposition of dead plants and animals and release the minerals back to soil, which can again be used up by the plant roots. **2. Sandy soil** : Sandy soil has large-sized particles. They cannot fit closely together so there are larger spaces between them. These spaces are filled with air. Hence, sandy soil is well aerated. Water can drain quickly through the spaces between the sand particles. Hence, sandy soils tend to be light, well-aerated and rather dry. Moreover, sandy soils also lack humus. Hence, these soils are not considered good for plant growth. Sandy soil is not sticky and is found in deserts, leaving no space of air. **Clayey soil** : The particle size is small and fine. They pack together tightly and can hold the water in these tiny gaps. Hence, these soils have less air but are heavy. They also contain some humus, hence these soils can favour growth of only some plants. Clayey soil is very sticky. It turns very hard on drying. **Loamy soil** : In loamy soil, the amount of large and small particles is nearly the same. It is a mixture of sand, clay and silt. Silt occurs as a deposit in riverbeds. The size of silt particles is between those of sand and clay. It is the perfect soil for the growth of plants. The soil has enough large and small spaces for air and water to flow in. The clay present in soil holds it together. It also contains enough humus, plant roots can easily penetrate through the spaces between particles. **3. Causes of Soil Erosion - Deforestation** : Indiscriminate cutting of trees is called deforestation. The root system of trees binds the soil together. In deforested / barren areas, water flows at a very high speed. Water does not seep down in soil in such areas. Hence, water carries away soil particles with it and deposits them in river which ultimately carries them to oceans. Forests reduce the speed of wind and thus prevents soil from being blown away. In deforested areas, the soil particles are easily blown away by wind. **Overgrazing** : Grazing animals destroy the grasslands especially the ones with shrubs. Sheep, goats, etc. nibble even the growing buds stopping further growth of plants. In this way, overgrazing destroy vegetation and results in barren lands. **Poor Farming Method** : Poor farming method is yet another cause of soil erosion. Ploughing loosens the soil and destroys its natural structures. Failure to replace humus after successive crops reduces the water holding capacity of soil. The soil thus dries and is blown away by winds on sloping ground, such soil may be eroded by water. **Forest Fires** : Forest fires destroy the vegetation thereby resulting in barren lands. These barren lands are liable to erosion by strong winds. Running water also removes soil from these lands. **4. Prevention of Soil Erosion - Soil Conservation** - Prevention of soil erosion is called soil conservation. Some of the methods of soil conservation are as follows : **Afforestation** : More and more trees should be planted to reduce soil erosion. Trees act as wind breakers. They decrease the speed of wind and thus save the soil from erosion. Tree roots hold the soil together and do not allow it to be carried by running water. The speed of water also decreases in forested areas. **Check on Grazing** : Animals should not be taken to fields for grazing. Instead, fodder should be provided to them in their sheds. **Terrace Farming** : Soil erosion due to running water is maximum on hill sides. Terrace farming should be practised on hills so as to decrease the speed of flowing water. In terrace farming, terraces are cut into the hillside, keeping

the slope from the edge of terrace towards the hill-side. Farming is done on these terraces. **Water** flows slowly through these terraces. A lot of water also goes down into the soil. **Growing Plants** : Roots of trees bind the soil particles together and prevent soil erosion. To reduce the effect of strong winds in the fields, trees should be planted along the boundaries of the field. **Building dams** : Floods can be controlled by building dams. This will help stop the flow of water thus prevent soil erosion.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself.

Chapter - 9 Respiration in Living Organisms

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. breathing 2. Occurs in presence of oxygen 3. 15-18 times 4. spiracles 5. stomata

B. Fill in the blanks :

1. substance 2. heat, light 3. Breathing 4. anaerobic respiration 5. diffusion

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. T. 4. T 5. F

D. Match the column 'A' with column 'B' :

1. inhalation & exhalation 2. organ of respiratory system 3. muscular cramps 4. cell surface 5. small white marking on woody stems

E. Very short answer questions :

1. This complex process involving intake of oxygen, oxidation of food to produce energy and removal of wastes like carbon dioxide and water and is called respiration. 2. The process in which a substance burns utilizing oxygen is called combustion. 3. Nostrils, Lungs are organs of the human respiratory system. 4. On woody stems, you can often see the small white markings called lenticels. These cells provide openings from the environment into the tissue of the stem.

F. Short answer questions :

1. Taking in (inhaling) oxygen rich air through the nose is called inhalation. Giving out (exhaling) of carbon dioxide rich air from the nose is called exhalation Both inhalation and exhalation are continuous processes through which our body exchanges gases (oxygen and carbon dioxide).

2. **Aerobic Respiration** : The breakdown of food substances (like glucose) takes place in the presence of oxygen with the release of a large amount of energy, it is called aerobic respiration. The process of aerobic respiration is represented as follows : **Glucose (food) + Oxygen**

Carbon dioxide + Water + Energy - The organisms which carry out aerobic respiration are called aerobic organisms or aerobes. Most of the living organisms including human beings respire aerobically. 3. Muscular cramps may develop as a result of heavy exercise or fast running. In fact, when muscle cells respire anaerobically, there is a partial breakdown of glucose and lactic acid is produced. 4. The younger portions of root possess root hair. Oxygen diffuses into root hair and passes into other cells for respiration. At the same time carbon dioxide from root hair diffuses into the soil. The older portions of root also possess lenticels for exchange of gases between the soil and root.

G. Long answer questions :

1. There are two types of respiration :

- Aerobic 2. Anaerobic respiration

Aerobic Respiration : The breakdown of food substances (like glucose) takes place in the presence of oxygen with the release of a large amount of energy, it is called aerobic respiration. The process of aerobic respiration is represented as follows : **Glucose (food) + Oxygen**

Carbon dioxide + Water + Energy - The organisms which carry out aerobic respiration are called aerobic organisms or aerobes. Most of the living organisms including human beings respire aerobically. **Anaerobic respiration :** The process of respiration which takes place in the absence of oxygen is called anaerobic respiration. In the process, glucose is broken down into ethyl alcohol and carbon dioxide with the release of energy. Since glucose is not completely oxidized in this process, very less energy (as compared to aerobic respiration) is produced in it. The process may be represented as follows : Glucose Ethyl alcohol + Carbon dioxide + Energy (Less amount) **2. The process of breathing takes place in two steps :**

Inhalation : During the process of inhalation (breathing in), the diaphragm and inter-costal muscles between ribs contract simultaneously. As a result, the diaphragm moves down, and the ribs move up and outwards. This increases the volume of chest cavity. Due to increase in volume of chest cavity the air pressure decreases inside the lungs. As a result, air from outside rushes into the lungs, i.e., inhalation takes place. The lungs thus inflate. **Exhalation :** During the process of exhalation (breathing out), the diaphragm and intercostal muscles present between ribs relax simultaneously. As a result, the diaphragm moves up and become dome-shaped, and the ribs move down and inwards. This decreases the volume of chest cavity. Due to increase in volume, the air pressure increases inside the lungs. This rushes the air out of the lungs. The lungs thus deflate. This is how exhalation takes place. **3. Mechanism of Breathing in Humans :** We breathe all the time, even when we are sleeping. On an average, we breathe more than 20,000 times a day. But how do we breathe? How we exhale the carbon dioxide-rich air and inhale the oxygen-rich air? We will try to find the answer of these questions in this section. Lungs are present in the chest cavity. This cavity is surrounded by ribs on its sides. A large muscular sheet called diaphragm forms the floor of the chest cavity. Breathing involves the movements of ribs and diaphragm. The movements of ribs are caused due to contraction/relaxation of inter-coastal muscles present between ribs. **4. (a) Amoeba** - Amoeba breathes by the process of diffusion through its entire body surface. Oxygen diffuses into the body and carbon dioxide diffuses out of the body through entire cell surface. **(b) Frog** - Frogs breathe through lungs as well as the moist skin. On land, the frog breathes through its nostrils and the air finally reaches the lungs, as in human beings. When in water, it breathes through its moist skin. **(c) Leaves** - Leaves of plants possess tiny pore-like structures called stomata. As you are aware, respiration takes place at all time. Oxygen is used in the process of respiration and carbon dioxide is released. During daytime, green parts of plants also perform photosynthesis in which they utilize carbon dioxide and produce oxygen. Oxygen-rich air enters the leaves through stomata. Now both respiration and photosynthesis takes place simultaneously in leaf cells. Since the rate of photosynthesis is greater than that of respiration, more oxygen is produced by plants. This extra oxygen is given out of the leaves through the stomata. During night, only respiration takes place thus oxygen is utilized and carbon dioxide is produced.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 10 Transportation of Material in Organisms

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. haemoglobin 2. WBCs 3. stethoscope 4. dialysis 5. transpiration
- B. Fill in the blanks :**
1. blood vessels, heart 2. Arteries 3. arteries, veins 4. leaves 5. stethoscope
- C. Write 'T' for true and 'F' for false statements :**
1. F 2. T 3. F 4. T 5. F
- D. Match the column A with column B :**
1. soldiers of the body 2. sphygmomanometer 3. haemoglobin 4. Dialysis 5. waste products of plants
- E. Very short answer questions :**
1. Due to the presence of pigment called haemoglobin that's why the blood is red. 2. Due to Platelets. 3. Its function is to store urine brought by the ureters. It can store about 300-800 ml of urine. 4. This loss of water in the form of water vapour from the aerial parts of the plant is known as transpiration.
- F. Short answer questions :**
- 1. It transports digested food from the small intestine to the other parts of the body.
 - It carries oxygen from the lungs to the body cells and carbon dioxide from the cells to the lungs.
 - It carries liquid waste from the body cells to the kidneys for removal from the body.
2. Lymphatic system is another circulatory system. It comprises of lymph nodes, lymph vessels and a circulating fluid called lymph. Lymph is a light yellow viscous fluid which flows in blood lymph vessels. It collects substances which cannot pass directly into the blood. It always flows from the tissues (group of cells performing specialized function) to special types of veins. It acts as a middleman between blood and tissues. 3. A number of wastes are produced in the body of organisms as a result of various metabolic activities. Accumulation of these wastes can be harmful for the organism as a number of them are toxic in nature. Hence, they need to be removed periodically. The removal of these metabolic wastes from the body is called excretion. Carbon dioxide, water, urea, uric acid, excess of vitamins, drugs, etc are common examples of such metabolic wastes. 4. Each kidney consists of a large number of coiled tubes called nephrons. They act as filters and filter waste products from the blood which reaches the two kidneys. The useful substances are absorbed back into the blood. Waste products dissolved in water form the liquid urine. The urine contains 95% water, 2.5% urea and 2.5% other waste products.
- G. Long answer questions :**
1. An adult human has 5 litres of blood. The blood consists of a fluid known as plasma in which three types of blood cells float. **Plasma :** Plasma is the liquid part of the blood. It is yellowish in colour. It consists of mainly water and some dissolved solutes like proteins, gases, nutrients (glucose, vitamins, amino acid etc.), waste products (urea, carbon dioxide, etc), enzymes, salts, etc. **Blood Cells :** There are three types of blood cells. **(i) Red Blood Cells (RBCs) :** Red blood cells are circular biconcave cells which are red in colour. Their red colour is due to the presence of a red coloured pigment called haemoglobin. Haemoglobin is the carrier of oxygen. It binds with oxygen and transports it to all parts and cells of the body. Life span of RBCs is 120 days. They are destroyed and replaced every second in our body. New RBCs are formed in the bone marrow of bones. **White Blood Cells (WBCs) :** They are colourless blood cells of different shapes and sizes. They are larger than red blood cells. Their life span is from 12 hours to several days. They destroy germs and help in fighting infection. Hence, they are also called the soldiers of the body. **Platelets :** Platelets are smaller than red blood cells. They help the blood to clot whenever there is a wound on the body. This blocks the flow of blood and prevents blood loss. 2. **Blood Vessels -** Blood circulates across the body through a network of tubes called blood vessels. There are three types of blood vessels - arteries, veins and capillaries. **Blood vessels are of following three types :** **Arteries :** They are the blood vessels which carry blood from the heart to various organs of the body. Arteries generally contain oxygen-rich blood. The walls of arteries are thick and

elastic. Their lumen is narrow. Most of the arteries are deep-seated hence, they cannot be easily seen. Blood flows in arteries with jerks due to pumping activity of heart. The blood in arteries is at high pressure. **Veins** : They are the blood vessels which carry blood from various organs of the body to the heart. Veins generally contain carbon dioxide-rich blood. The walls of veins are thin and less elastic. Their lumen is wide. Most of the veins are superficial, i.e., they can be easily seen. The greenish blue lines we see just below the skin of our hands are veins only. Blood flows smoothly and slowly inside the veins. The veins have valves which prevent the back flow of blood. **Capillaries** : They are very narrow blood vessels having thin walls. They join the arteries and veins. The exchange of oxygen, carbon dioxide dissolved food, excretory products between tissues and blood flowing in capillaries takes place through the thin walls of capillaries. **3.** The heart is the pumping organ of the blood vascular system. It pumps blood to all the parts of the body through the blood vessels. Human heart is a conical, hollow and muscular structure of the size of our fist. It is reddish in colour and is present in between the lungs. Its broad base is upwards while narrow pointed end is downwards and tilted towards left. Heart is covered by a narrow fluid filled membranous sac called the pericardium. The fluid protects the heart from external shocks. Internally, heart is four-chambered. The two upper chambers are called atria (singular : atrium). Atria are smaller and thin walled. The lower two chambers are called ventricles. They are larger and thick walled. The atrium of its side opens into the ventricle of its side. Its opening is guarded by valves. The blood enters the heart through atria and leaves it through ventricles. The right side of the heart is completely separated from its left side by means of a wall called septum. The left atrium receives oxygenated blood (oxygen-rich blood) from the lungs and the left ventricle sends it to various parts of the body. The right atrium receives deoxygenated blood (carbon dioxide-rich blood) from the body and the right ventricle sends it to the lungs for oxygenation. The septum prevents the mixing of oxygenated and deoxygenated blood. **4. Transportation of Water and Minerals** - Plants absorb water and dissolved minerals with the help of hair-like extensions present on root. These extensions are known as root hairs. The root hairs increase the surface area of the root for the absorption of water and mineral nutrients dissolved in it. The root hair is in contact with the water present between the soil particles. They absorb water along with dissolved minerals. This water and absorbed minerals pass from cell to cell and finally reach the root xylem vessels. Water is absorbed by the root hairs from soil by the process called osmosis. Osmosis is the process in which water moves from its region of higher concentration to a region of its lower concentration through a semi-permeable membrane. A semi-permeable membrane is one that allows only some substances to pass through it.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself.

Chapter - 11 Reproduction in Plants

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. yeast 2. leaf 3. grafting 4. stigma 5. Sunlight

B. Fill in the blanks :

1. Reproduction 2. Stem 3. Pollinated 4. Seed 5. Light and can be easily carried.

C. Write 'T' for true and 'F' for false statement :

1. F 2. T 3. F 4. T 5. F

D. Match the column A with column B :

1. bacteria 2. rose 3. cucumber 4. vallisneria 5. pea

E. Very short answer questions :

1. Reproduction is the process by which existing living organisms produce new young ones of their own kind. For example, a cat produces kittens which grow into adult cats. 2. Sporangia reproduces by spore formation 3. China rose, mustard are sexual flowers 4. Ovary

F. Short answer questions :

1. Binary fission : This type of reproduction is commonly seen in unicellular organisms like bacteria. In it, the parent cell divides into two equal halves. The nuclear material also divides into two parts. The two parts then grow into new individuals. **2. Sexual reproduction** is the most common method of reproduction in plants. In this process, two reproductive cells called gametes are produced from the reproductive organs. **3.** While collecting nectar from a flower, some pollen grains stick to their wings and legs and are transferred to another flower on which they sit. This transfer of pollen grains from one flower to another of the same kind is called pollination. **Pollination is of following two types :** 1. Self Pollination 2. Cross Pollination **4.** The flowers pollinated by wind are small and dull. They lack nectar and scent. Their stamens have long filaments so that the anthers project outside the flower. The stigma are large and well- exposed. The pollen grains are light, dry, smooth and not easily wetted rain. Thus they are easily blown by wind.

G. Long answer questions :

1. Asexual Reproduction in Plants - Binary fission : This type of reproduction is commonly seen in unicellular organisms like bacteria. In it, the parent cell divides into two equal halves. The nuclear material also divides into two parts. The two parts then grow into new individuals. **Budding :** Budding is commonly seen in yeast. A small bulb-like projection called the bud is formed on the body and finally breaks off and grows into a new organism. **2. Advantages of Vegetative Propagation -** The plants produced by this method are identical copies of their parents. Also, the plants produced by this method take less time to grow. In areas where seed germination fails, vegetative propagation can be helpful in establishing the plants. New varieties with desired qualities can be produced by this method. **3. Successful pollination** is followed by fertilization in plants. Pollen grain (male gamete) which falls and sticks to the stigma starts to germinate. It starts developing a pollen tube which grows downwards into the style. The pollen tube carries the male gamete through the style into the ovary. The male gametes then enter an ovule which contains the female gamete or egg. These male and female gametes fuse together and form the fertilized egg or the zygote. This fusion of male and female egg cell in the ovary is called fertilization. The other parts of the flower such as the sepals, petals and stamens fall off. Sometimes, style and stigma also fall off and only the ovary remains there after fertilization. **4. Wind Pollination -** The flowers pollinated by wind are small and dull. They lack nectar and scent. Their stamens have long filaments so that the anthers project outside the flower. The stigma are large and well- exposed. The pollen grains are light, dry, smooth and not easily wetted rain. Thus they are easily blown by wind. Wind pollinated flowers produce pollen grains in large quantities as wind pollination is a highly wasteful method of pollination. Wheat, maize, date palm and a number of grasses are pollinated by wind. **Insect Pollination -** Insect-pollinated flowers are large and showy. They are brightly coloured. They have sweet fragrance and sweet nectar to attract insects. The stigma is rough and sticky to catch the pollens. The pollens are also usually rough and sticky so that they can easily stick to the bodies of insects. Rose, lily, etc, are insect-pollinated flowers. **Water Pollination -** Aquatic plants have different mechanisms to affect pollination. The pollen grains of water-pollinated plants are light and can float in water. Zostera, ceratophyllum and vallisneria are water-pollinated plants.

H. Label the following diagram and state and state one use of the each part given below :

Do it yourself

Group Discussion

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Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 12 Motion and Time

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. periodic motion 2. 1 second 3. speedometer 4. distance / time 5. Compare speeds of moving objects

B. Fill in the blanks :

1. sun 2. pendulum 3. second 4. speed 5. speed

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. F 4. F 5. T

D. Match the column 'A' with column 'B' :

1. periodic motion 2. gnomon 3. measures speed 4. astronomical observatory 5. exhibits periodic motion

E. Very short answer questions :

1. Speed is defined as the distance travelled per unit time. 2. Maharaja Jai Singh II of Jaipur sundials in India. 3. m / sec is the SI unit of speed. 4. A body moving in a straight line covering equal distances in equal intervals of time is said to be moving in uniform motion.

F. Short answer questions :

1. Time is very important for us. From the time we get up in the morning to the time we sleep, we do innumerable things and that too, according to time. Our schools start at particular time. Our every period begins at a particular time and also ends at a particular time. The school closes at particular time. Similarly, we also see that the various trains arrive at a particular station at specific times and we can catch them only if we reach the station before their time of arrival. Similar is the case with buses. Your father's office opens and closes at a particular time. Various institutions, offices, banks, shops, also work according to time, i.e., they open and close at particular time and also have their lunch time at a particular time. We can see our favourite TV programmes at particular times. Thus we see that time is very important for us in our daily activities and we can do all our various activities properly only if we are able to measure time accurately. 2. A simple pendulum works on the principle of periodic motion i.e. a motion that repeats itself after a fixed interval of time. The fixed time was recorded as a unit and multiples of this unit were used to calculate short durations within a day. 3. An object that takes longer time to cover a certain distance is said to exhibit slow motion while the one that takes less time to cover the same distance is said to exhibit fast motion. 4. If a body moving in a straight line covers equal distances in unequal intervals of time or vice-versa, the body is said to be moving non-uniform motion on the other hand. A body moving in a straight line covering equal distances in equal intervals of time is said to be moving in uniform motion.

G. Long answer questions :

1. **Sand Clock** - Sand clock, also called hour clock, works on the principle that all the sand from the upper glass chamber fall into the lower glass chamber in a fixed amount of time. This fixed amount of time was the unit in which time was measured. **Water Clock** - Water clock is the same as sand clock except that water is used in place of sand. In it, water falls from the upper chamber to the lower chamber through a hole. The level of water in the

lower chamber corresponds to a specific time interval. **2. Stop Watch Clock :** Stop clocks and stopwatches are used in laboratories and sports to measure short intervals of time accurately. They can be started and stopped at any time at will. **Wrist Watch -** A mechanical wrist watch has a balance wheel. The function of the balance wheel is the same as that of a pendulum in pendulum clocks. It controls the movement of hands of a clock. **3.** Time may be defined as the gap between two events. The standard unit for measuring time is second. It is represented by letter 's'. It is a small unit of time. The larger units of time as follows : 60 seconds = 1 minute, 60 minutes = 1 hour, 24 hours = 1 solar day, 30 solar days (31 solar days) = 1 month, 12 months = 1 year, 10 years = 1 decade, 10 decades (100 years) = 1 century, 10 centuries (1000 years) = 1 millenium **4.** Do it yourself

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 13 Electric Current and Its Effects

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. closed circuit 2. battery 3. element 4. material 5. electric motor

B. Fill in the blanks :

1. bad 2. Cell 3. circuit 4. short-circuit 5. electromagnet

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. T 4. T 5. T

D. Very short answer questions :

1. iron, copper are conductors of electricity. 2. Switch is another important element of the circuit. It helps us to close or open the circuit. 3. Alloy of aluminium, nickel & cobalt are used for making permanent magnet. 4. An electric fuse is a short piece of wire made of an alloy of tin and lead.

E. Match the column 'A' with column 'B' :

1. flow of electric charge 2. glows bulb 3. element of circuit 4. safety device 5. permanent magnet

F. Short answer questions :

1. Open Circuit - The circuit in which the various components connected between the cells have a break at some point is called an open electric circuit. No current flows through an open circuit.

Closed Circuit - The circuit is which the various components are connected between the cells without any break is called a closed electric circuit. Electric current flows through a closed circuit.

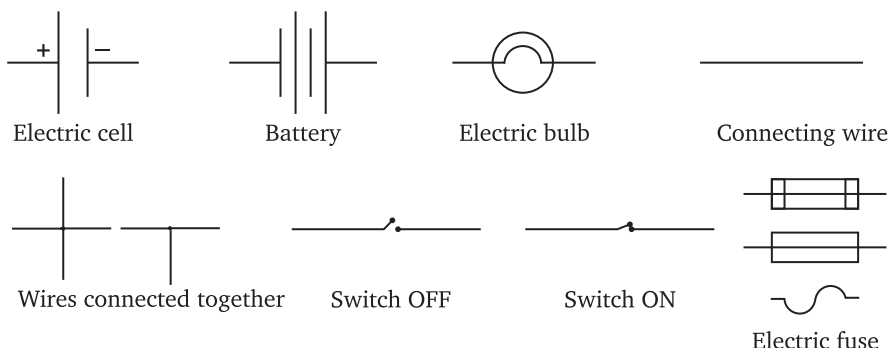
2. When electric current flows through a wire, a part of electrical energy of converted into heat energy and the wire gets heated. **3.** The wires we use in circuits have three types of wires live wire (red wire), neutral wire (black wire) and the earth wire (green wire). When the live wire and neutral wire come in direct contact due to wear and tear or melting of insulation of wires, the resistance of the circuit becomes zero. As a consequence, very large current flows through the circuit. This condition is called short-circuit. **4.** The advantage of MCB over fuse is that the same MCB can be reset again and again to restore the electricity supply while a broken fuse wire needs to be changed. In order to get good quality MCBs, we should look at the ISI marks on them also.

G. Long answer questions :

1. Elements of Circuit - 1. Cell of battery - Cells is the source of electric current. It has two terminals, one positive and the other negative. The most commonly used cell in the laboratory is the dry cell. When two or more cells are used to draw an electric current, the combination of cells

is called a battery. In a battery, the individual cells are connected in series or parallel. **2. Switch :** Switch is another important element of the circuit, it helps us to close or open the circuit. When the switch is in 'ON' position, the current flows through the circuit. The circuit is now said to be closed. On the other hand, when the switch is in 'OFF' position, no current flows through the circuit. The circuit is now said to be open.

2. Symbols of some commonly used components are shown below :



3. The substance around which the coil is wound is called core. The soft iron core, embraced by a current - carrying coil, which shows appreciable magnetic effects only as long as the current is flowing in the coil is called an electromagnet. The strength of an electromagnet can be increased by **(i)** increasing the current in the coil ; and **(ii)** increasing the number of turns in the coil. Electromagnet is a temporary magnet. A permanent magnet can however be prepared by placing a steel of ALNICO (alloy of aluminium nickel and cobalt) rod in the current-carrying coil. **Uses of Electromagnet** - Electromagnets are used in lifting heavy iron scraps in junkyards. Electromagnets are used to store information in magnetic tapes, audio cassettes and videotapes. Electric motors produce motion from electromagnetism. Many toys have electromagnets inside them. **4. Electric bell** - An electric bell is the most common application of electromagnets. It consists of an electromagnet, a springy iron strip, a hammer, a gong, two switches and connecting wires. When you press the switch of the call bell at your door, the current passes through the circuit and the electromagnet pulls the springy iron strip 'S', which forms one terminal of the other switch 'T'. As the strip moves towards the electromagnet, its contact with terminal 'T' is lost. This breaks the circuit. As a result, the electromagnet stops attracting the iron strip. The strip goes back to its original position and its contact with terminal T is reestablished. This backward and forward movement of the iron strip takes place many a times in a second and produces sound. The loudness of the sound may be enhanced with the help of a hammer attached to strip 's' which in turn strikes the gong 'G'.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 14 Winds, Storms and Cyclones

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. wind 2. pressure 3. loss of pressure 4. eye of storm 5. typhoons

B. Fill in the blanks :

1. Wind 2. rises 3. lighter 4. waves 5. meteorological

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. T 4. F 5. F

D. Match the column 'A' with column 'B' :

1. moving air 2. air exerts pressure 3. funnel shaped 4. brings a lot of sea water on land 5. issued warnings

E. Very short answer questions :

1. Otto von Guericke was first to demonstrate air exerts pressure. 2. This warm air rises up, cool heavier air comes down. The warm air cools as it reaches the upper levels of atmosphere and comes down to fill the space created by movement of cold air. In this way, wind currents are generated. 3. Barometer is used to measure atmospheric pressure. 4. A rotating column of air ranging in width from a few metres to more than a kilometre accompanied by a funnel shaped downward extension of a cumulonimbus cloud is called a tornado.

F. Short answer questions :

1. The surface of the earth is not heated evenly. A region which is strongly heated has warm air over it. As you know, this warm air rises up and produces a region of low pressure on the earth's surface. As this warm air rises up, cool heavier air comes down. The warm air cools as it reaches the upper levels of atmosphere and comes down to fill the space created by movement of cold air. In this way, wind currents are generated. 2. You must have that smoke always goes upwards. It is because of the fact that smoke contains hot gases which, being lighter, rise up. A hot air balloon also rises up because of a similar reason. When the air inside the balloon is heated, it expands and becomes lighter. This lighter air rises upwards taking the balloon along with it. 3. These storms occur when high levels of condensation form in a volume of unstable air that generates deep and rapid upward motion in the atmosphere. The heat energy creates powerful rising air currents that swirl upwards. Cool descending air currents produce strong down draughts below the storm. 4. A cyclone is an area of closed circular fluid motion rotation in the same direction as the earth. It is usually characterized by inward spiralling winds that rotate anticlockwise in the northern hemisphere and clockwise in the southern hemisphere.

G. Long answer questions :

1. Thunderstorm - It is a type of storm that generates lightning and thunder. It is normally accompanied by heavy rains. Thunderstorms occur throughout the world but mainly in tropical rainforest regions where there are conditions of high humidity and temperature along with atmospheric instability. **Tornado** - A rotating column of air ranging in width from a few metres to more than a kilometre accompanied by a funnel shaped downward extension of a cumulonimbus cloud is called a tornado. Tornadoes come in many shapes and sizes but are commonly in the form of a funnel whose narrow end touches the earth while the broad end touches the cloud. 2. The two activities clearly show that air exerts pressure. There are some daily observations which further support the fact. 1. If the wind is blowing opposite to the direction of a bicycle, it is difficult to ride it. It is because the moving air from the opposite direction exerts a good amount of pressure. 2. When you fly a kite, the air is always blowing from the direction in which your back is. It is the pressure of moving air which helps in the flying of a kite.

3. If a storm is accompanied by lightning we must take the following precautions :

- Do not take shelter under an isolated tall tree.
- Do not lie on the ground.
- If in a forest, take shelter under a small tree.
- If in an open get inside a home or building or inside an all metal vehicle.
- If inside a vehicle, close all the windows and stay there.
- Inside a home, avoid using telephones.
- Get out of and away from open water.

- Get away from tractors and other metal equipments.
 - Avoid standing in open garages, storage sheds and metal sheds.
- 4. Precaution for Cyclone hit areas :**
- Do not drink contaminated water as it can cause water borne diseases. Use water that you have stored for emergencies.
 - Do not go out just for fun as you can create problems for the rescue team unknowingly.
 - Do not touch fallen electric wires and poles as you can get electrocuted.
 - Assist the rescue team if you can.
 - Do not make undue demands from the rescue team.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 15 Light

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. rectilinear propagation of light 2. virtual image 3. lens 4. can be taken on screen 5. dispersion

B. Fill in the blanks :

1. Light 2. Ray 3. reflection 4. depends on the position of object 5. dispersion

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. F 4. F 5. F

D. Match the column 'A' with column 'B' :

1. virtual image 2. reflection 3. colours of rainbow 4. diverges parallel beam of light 5. splitting of white light

E. Very short answer questions :

1. Light always travels in a straight line. This property of light is known as rectilinear propagation of light. 2. Real image is formed when the light rays coming from the object actually meet after reflection. It can be obtained on a screen. It is always inverted. 3. A convex lens converges parallel beam of light and a concave lens diverge parallel beam of light. 4. A lens is a piece of transparent material which has one or two spherical surfaces.

F. Short answer questions :

1. A plane mirror is a flat surface that produces an erect and virtual image of a real object.

Plane mirrors are used :

- As looking glasses.
- In Kaleidoscopes.
- In periscopes.
- In solar cookers for reflecting sunlight.

2. Laws of Reflection of light - The reflection of light from a surface takes place in accordance with two laws. These laws are known as laws of reflection of light. They are states as follows :

- The angle of incidence is always equal to the angle of reflection.
- The incident ray, the reflected ray and the normal at the point of incidence, all lie in the same plane.

3.	S.No.	Virtual Image	S.No.	Real Image
	1.	Virtual image is formed when the light rays coming from the object do not actually meet after reflection.	1.	Real image is formed when the light rays coming from the object actually meet after reflection.
	2.	It cannot be obtained on a screen.	2.	It can be obtained on a screen.
	3.	It is always erect.	3.	It is always inverted.

4. Do it yourself

G. Long answer questions :

1. To show that light travels in a straight line. Take a chart paper and roll it into a pipe. Look at a lighted candle through it as shown in Fig. Take care not to touch the chart paper with the flame. Now bend the pipe from the middle and repeat the activity. Can you still see the flame of candle. No, the flame of candle is no more visible. Light travels in a straight line and does not bend with the pipe. The above two activities verify the rectilinear propagation of light. **2.** A plane mirror is a flat surface that produces an erect and virtual image of a real object. If you place a lighted candle in front of a plane mirror, you will see the image of the candle in the mirror. The candle which appears inside the mirror is called the image of the candle and the actual candle is called the object. **3.** A plane mirror is a flat surface that produces an erect and virtual image of a real object. If you place a lighted candle in front of a plane mirror, you will see the image of the candle in the mirror. The candle which appears inside the mirror is called the image of the candle and the actual candle is called the object. **Concave Mirror :** The spherical mirror which reflects light from its curved-in surface is called concave mirror. **Convex Mirror :** The spherical mirror which reflects light from its bulged-out surface is called convex mirror. **4.** The splitting of white light into colours is called dispersion. Sunlight is light, constituting lights of seven main colours. The set of seven colours is called the spectrum of light. These seven colours in order are violet, indigo, blue, green, yellow, orange and red (VIBGYOR). You see a rainbow in the sky, when it is bright after a downpour. The sunlight passes through the raindrops in the sky and splits into its seven colours.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 16 Water : A Precious Resource

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. 97.4% **2.** both a & b **3.** all of these **4.** ocean water **5.** all of these

B. Fill in the blanks :

1. 70% **2.** transpiration **3.** same **4.** rainwater **5.** Seas, Oceans

C. Write 'T' for true and 'F' for false statements :

1. F **2.** T **3.** F **4.** T **5.** T

D. Match the column 'A' with column 'B'.

1. upper level of groundwater **2.** seeping of water into ground **3.** watering the roots of plants **4.** purest form of water **5.** water scarcity

E. Very short answer questions :

1. Water with low salt content is called fresh water. **2.** Rain forms a part of the water cycle. Rainwater is the purest form of water. **3.** Groundwater can be obtained by making tube wells and

digging wells. This water is usually considered safe for drinking but it may also contain germs. **4.** 97.4% water present in oceans.

F. Short answer questions :

1. Rain water, Surface water, Seas & Oceans, Ground water are different sources water. **2.** The soil at the surface is dry. If we go on digging deeper into the soil, we would find that soil below is moist. If we still continue to dig deeper and deeper we would ultimately reach a level where all the space between particles of soil and gaps between rocks are filled with water. The upper limit of this layer is called water table.

3. Water is a precious natural resource. In order to make water easily available to us in future. We have to conserve it today. A few ways by which water can be conserved are as follows :

- Do not leave taps running while brushing teeth, shaving or washing clothes.
- Construct dams and reservoirs to control floods and collect water.
- Recycle water in industries and use it as many times as possible, before disposing it.
- Treat sewage and factory wastes before disposing them into water bodies.

4. Rainwater harvesting. It is done by allowing rainwater falling on roofs of building to flow into a deep trench in the ground.

G. Long answer questions :

1. Water Conservation - Water is a precious natural resource. In order to make water easily available to us in future, we have to conserve it today. A few ways by which water can be conserved are as follows :

- Do not leave taps running while brushing teeth, shaving or washing clothes.
- Farmers should use better methods of irrigation like drip irrigation, in which water is supplied to plants drop by drop instead of filling the entire field with water.
- Construct dams and reservoirs to control floods and collect water.
- Recycle water in industries and use it as many times as possible, before disposing it.
- Plant trees to slow down the flow of rainwater on land and to increase seepage of water into soil.
- Treat sewage and factory wastes before disposing them into water bodies.
- Use biodegradable fertilizers and pesticides.
- Practise rainwater harvesting. It is done by allowing rainwater falling on roofs of building to flow into a deep trench in the ground.

2. The water table does not get affected as long as the water drawn from the ground gets replenished by seepage of water from various natural resources. But if water is not sufficiently replenished, the water table may go down. The major reasons of depletion of water table are as follows : **SCANTY RAINFALL** : In areas with scanty rainfall, there is not enough rainwater to recharge the groundwater. In such areas the water table goes down. **INCREASING POPULATION** : Increasing population requires more water for cooking, drinking, bathing, washing etc. Thus more groundwater is drawn to fulfill these requirements. Thus increasing population increases consumption of water on one hand and decreases the available water. **INDUSTRIALIZATION** : Almost all industries need water, Groundwater is mainly used by them. With the continuous increase in the number of industries, there is depletion of groundwater. **AGRICULTURAL ACTIVITIES** : For growing population, more food is required. As we already know India is an agricultural country and farmers depend on rains for irrigating their fields. However, erratic monsoons result in excess use of groundwater thereby decreasing underground water. **DEFORESTATION** : Forests are also cleared for constructing industries and for growing food for the increasing population. Clearing of forests and destruction of vegetation decreases the seepage of water into the ground thereby preventing the groundwater from being replenished. **3.** 70% of the water is available on the earth, almost 97.4% found in oceans and only 2.6% is present in rivers, lakes, ponds, ice caps as groundwater and in the atmosphere. Moreover water is renewable. Still we hear about shortage of water at different places. It is because of distribution of

water on earth is uneven. Some of the area receive so much water that there are floods almost every year. For example, some parts of north-east India receive rain almost daily. On the other hand, there are some areas which hardly receive any rain throughout the year. The desert of Rajasthan is an example of such an area. Millions of people in our country and several other countries have to face great hardships to meet their minimum requirements of water. People have to travel long distances to fetch water. You must also have long queues of people for water.

- Of the total water available on earth, 97.4% is present in seas and oceans. This water has high salt content and hence cannot be used by us.
- Of the remaining water, 2% is locked up in glaciers and polar ice caps. This water is fresh water but being in solid state, it is not available to us for our various activities.
- The remaining 0.6% water is fresh water present in liquid form. Of this 0.6% water, only 0.01% water is present on the surface of earth as surface water while the rest (0.59%) is present as ground water.

4. The water from different water bodies like seas, oceans, lakes, rivers etc is evaporated by the heat of the sun. Plants also give out a lot of water vapour by the process of transpiration. The water vapour rises up. As it rises up higher in the atmosphere it cools and condense to form tiny drops of water. These drops of water together form cloud. These drops of water continue to float in air. As more and more water vapour condenses, the drops of water continue to increase in size. When they become too heavy to float in air, they fall on the earth in the form of rain. When the temperature is low, they may fall down as snow or hail. The rainwater falls on ground, lakes, rivers, oceans, etc. A part of water that falls on ground seeps into the ground which forms the ground water while the remaining drains into rivers and streams. The snow that falls also melts and finds way into rivers and streams. The water from rivers and streams ultimately reaches the seas and oceans. This water again evaporates and the whole process starts once again.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 17 Forests

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. crown 2. humus 3. green plants 4. All of these 5. Afforestation

B. Fill in the blanks :

1. Shape, Size 2. Forest floor 3. habitat 4. all animals 5. Food chain

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. F 4. T 5. F

D. Match the column 'A' with column 'B' :

1. forest product 2. decomposer 3. forest fire 4. grass 5. planting tree

E. Very short answer questions :

1. Canopy, Crown, Understorey are the layers of forest. 2. The layer of vegetation just below the canopy is the understorey. 3. When many food chains interlink with each other, they form a food web. 4. Large scale planting of trees called afforestation.

F. Short answer questions :

1. **Canopy** : The branches of the tall trees form a shady and protective umbrella over the rest of the plants in the forest. This is called a canopy. **Crown** : The part of a tree, above the stem,

which has branches is known as the crown of the tree. Crowns differ in shape and size in different trees. **2.** Latex obtained from rubber trees is used for making rubber. Resins obtained from trees is used to make paint and varnish. Eucalyptus, pine and sandalwood yield oil. **3.** A food chain is a series of living things which are linked together because each is the food for the others in the chain. Green plants make their own food by utilising solar energy. The solar energy is converted into chemical energy of food by the green plants so they are called producers. **4.** A number of animals like monkeys, apes, lion, elephants, bear and a number of insects like beetles, ants, grasshoppers, etc. inhabit the forests. Thus plants also provide shelter and security to the animals. Thus, animals depend on plants for food, oxygen and shelter.

G. Long answer questions :

1. There are some uses of forest which are given below :

Provide food and shelter : All animals obtain food from the plants, either directly or indirectly. Herbivores feed directly on plants and plants produce while carnivores feed on the flesh of other animals. Forests serve as habitat for a large number of animals. Insects like grasshopper, moth, butterfly, caterpillar, etc. find shelter among plants. Animals like monkeys, squirrels, apes, etc. live on trees. **Provide wood :** Trees like sal, shisham, teak, etc. growing in forests provide us wood. The wood obtained from these trees is used for a number of purposes. Wood pulp is also used in the preparation of paper. **Provide a number of other available products :** We obtain a number of other valuable things from forests. A number of plants yield medicines. Quinine, a medicine used in the treatment of malaria, is obtained from the bark of cinchona tree. Plants like neem, tulsi, amla, eucalyptus, etc. are well known for their medicinal values. **Maintain balance of gases in nature :** They produce oxygen by the process of photosynthesis. Forests maintain the balance of carbon dioxide and oxygen in the atmosphere. That is why forests are also called green lungs of nature. **Prevent soil erosion :** Trees prevent soil erosion by holding the soil particles together through their root system. Thus, wind or water is not able to bring about soil erosion. **2.** They produce oxygen by the process of photosynthesis. Forests maintain the balance of carbon dioxide and oxygen in the atmosphere. That is why forests are also called green lungs of nature.

3. Destruction of forests or cutting down of trees on a large scale is called deforestation. Areas which were once covered with forests are now concrete jungles, as you find more and more tall buildings.

The harmful effects of deforestation are :

- Large areas are cleared to make housing colonies, hospitals, markets, offices, etc. for the growing population.
- Trees are felled for obtaining fuel wood for cooking.
- Forests are cleared for growing crops for the increasing population.
- Forests supply raw materials to a number of industries. The forests are cut down to meet the demands of these industries.

4. The maintenance and use of forest products in a way that the forests are not destroyed is called forest conservation. We should follow these methods to conserve our forests. Only diseased and damaged trees should be felled for obtaining fuel wood. If it is necessary to fell trees then same number of trees of the same species should be planted in the nearby area. The forests should be renewed or raised by planting trees. This is termed as afforestation. Forest fires are usually caused due to human carelessness or lightning or due to friction between trees. These fires destroy forests in a large area in no time. Better technology should be used to detect and extinguish forest fires. National parks, wildlife sanctuaries and biosphere resources should be protected.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Periodic Assessment - I

Do it yourself

Half-Yearly Examination

Do it yourself

Periodic Assessment - II

Do it yourself

Final Examination

Do it yourself

Book-8

Chapter - 1 Crop Production and Management

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Gram 2. May to July 3. Organic nutrient 4. rhizobium 5. seed drill

B. Fill in the blanks :

1. Crop 2. preparation 3. earthworms, microbes 4. fallowing 5. water, oxygen

C. Write T for true and F for false statements :

1. T 2. F 3. F 4. F 5. T

D. Very short answer questions :

1. Agriculture is thought to have begun around 10,000 B.C. Before that time, the humans were nomadic wanderers who went from place to place in search of food and shelter. 2. Seed drill is used to sow drills 3. Three natural methods of replenishing nutrients in the soil is morning, following and fertilising. 4. The breeding, feeding and caring of domestic animals on a large scale by humans to earn profit is called animal husbandry. 5. Harvester used to cut mature crop.

E. Short answer questions :

1. A. Preparation of soil B. Sowing C. Adding manure and fertilisers D. Irrigation E. Protection from weeds F. Harvesting G. Storage 2. Dead plants, animals and other organic matter on the field are decomposed by the microbes. Thus, the nutrients are returned to the soil. This is called following. 3. This process is called nitrogen-fixation wheat crop used nitrogen in the form of nitrates, leading to the deficiency of nitrogen in the soil. The roots of leguminous plants have many protuberances called root nodules which contain nitrogen-fixing bacteria called Rhizobium. 4. Once the crop is matured, it is harvested. The cutting of crop after it has matured is called harvesting.

F. Long answer questions :

1. The soil anchors the roots of a plant thus providing it stability. The roots can go deep into turned and loosened soil, where they can easily absorb oxygen, water nutrients. The organisms living in the soil such as, earthworms and microbes can easily increase in number and also they come to the top and add humus to it by decomposing the dead plants and animals. It also brings the nutrient-rich soil to the top so that plants can use these nutrients. Thus, turning and loosening of soil is very important for cultivation of crops. 2. Sometimes seeds are not directly planted in to the soil, as in rice, onion, tomato, chili and brinjal. Instead, they are planted in seed beds called nurseries. After they germinate, the small plantlets are transferred and transplanted in the field. This helps the farmer select only the healthy seedlings and space them properly while planting. This way, the crop yield is increased. 3. Many undesirable plants that grow naturally along with the crop are called weeds. These weeds compete with the crop plants for water, nutrients, space and light and hence affect the growth of the crop. This reduces the yield of the crop. They also spread very fast. Some weeds interfere even in harvesting and may be poisonous for animals and human beings. Different weeds grow with different crops. One such common weed which grows with almost every crop is amaranthus. The best time for the removal of weeds is before they produce flowers and seeds. The weeds may also be removed by hands by uprooting or cutting them close to the ground, from time to time. 4. **Methods of Irrigation** - There are 2 methods of irrigation. 1. Traditional method 2. Modern method 1. **Traditional method** - The various traditional ways are. (a) Moat (b) chain pump (c) Dhekli (d) Rahat 5. clause 6. clause 2. **Modern Method** - The modern methods used as follows - (a) **Sprinkler system** - In this system, the water is supplied to the fields through perpendicular pipes which have rotating nozzles on top are connected to main pipeline at regular intervals. When the water is pumped into main pipe, it is sprinkled on to the crop as rain, from the rotating nozzles. The system is very useful for sandy soil. This system is used in regions with uneven land where sufficient water is not available. (b) **Drip System** - In this system, the water drips slowly near the roots of the plants

through a network of pipes and tubes, hence it is called drip system. In this technique, there is no wastage of water. Also as there no flooding of water, there is no danger of fertiliser run off. It is the best technique for watering fruit plants, gardens and trees. It is also called as trickle system. But this system is very expensive.

5. Fertilizers are man-made chemical substances which are rich in a particular nutrients and are produced in factories. Some examples of fertilisers are-urea, ammonium sulphate, potash, NPK (Nitrogen, Phosphorus and Potassium) they are soluble in water and easy to store but excessive use of fertilisers makes the soil less fertile; where as manure is an organic substance obtained from the decomposition of plants and animals wastes. The use of manure improves soil texture as well as its water retaining capacity. Manure makes the soil porous and helps in easy exchange of gases. The table is given below to differentiate a fertiliser and manure -

S.No.	Fertilizer	Manure
1.	A fertiliser is an inorganic salt. It is artificially prepared by man.	Manure is a natural substance obtained by the decomposition of cattle dung, human waste and plant residues.
2.	A fertiliser is prepared in factories.	Manure can be prepared in the fields.
3.	A fertiliser does not provide any humus to the soil.	Manure provides a lot of humus to the soil.
4.	Fertilisers are very rich in plant nutrients like nitrogen, phosphorus and potassium.	Manure is relatively less rich in plant nutrients.
5.	Excessive use leads to soil pollution.	Does not pollute soil.

Chapter - 2 Micro-organisms : Friends and Foes

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Viruses **2.** Carbon dioxide **3.** Protozoa **4.** Algae **5.** All of these

B. Fill in the blanks :

1. microscope **2.** atmospheric oxygen **3.** bacilli **4.** yeast **5.** Bacteria

C. Write 'T' for true and 'F' for false statements :

1. F **2.** F **3.** F **4.** T **5.** F

D. Very short answer questions :

1. Microbiology is the study of micro organism **2.** No, they may be unicellular or multicellular **3.** Spherical bacteria is known as Spirilla **4.** Yeast is a Fungus

E. Short answer questions :

1. There are other living organisms around us and inside our body which we cannot see with eyes alone. We need a microscope to see these organisms. These organisms are called micro-organisms or microbes. The study of micro-organisms is called microbiology. These microbes inhabit almost every place on the earth, be it the hottest desert or the coldest icy polar region. Some microbes live in the cracks on the sea floor while some can even survive volcanic eruptions. Micro-organisms like amoeba can live alone, while fungi and bacteria may live in colonies. **2.** Some algae are found in snow and some in hot springs. They also grow in moist soil, barks of trees and rock surfaces. Though most algae are microscopic, some like seaweeds are quite large. Algae such as chlamydomonas and chlorella are unicellular whereas others such as kelp are multicellular. **3.** Outside a cell, they cannot reproduce, grow or use energy or respond to changes, which seem to suggest that they are non-living. In this state, they are called virions. But once they enter a living cell of an organism, they begin to reproduce just like a living cell, using the energy of the host for the purpose. **4.** The milk is heated to about 70°C for 15 to 30 seconds and then suddenly chilled

and stored. This process was discovered by French chemist, Louis Pasteur. It is called pasteurization.

F. Long answer questions :

1. Micro organisms are classified into five major groups. These groups are as follows:

- Bacteria (Singular : Bacterium)
- Fungi (Singular : Fungus)
- Algae (Singular : Alga)
- Protozoa (Singular : Protozoan)
- Viruses (Singular : Virus)

Bacteria - Bacteria are single-celled organisms. They can be found almost anywhere, be it air, water, soil and in the bodies of living organisms, including human beings. These are amongst the simplest and very small living beings. The size of a bacterial cell varies from 0.2 to 100 microns. Bacteria are mainly found in three different shapes: round, rod shaped and spiral shaped. Round bacteria are known as cocci, rod shaped bacteria are known as bacilli and spiral shaped bacteria are known as spirilla. All the bacteria have one or more than one long whip-like structure called flagellum which is used for locomotion. **Fungi** - Fungi are non-green plants as they lack chloroplast and cannot make their own food. They are either parasitic (obtaining food from other organisms) or saprophytic. They may be unicellular or multicellular. While yeast is unicellular, bread mould is multicellular. Though fungi are found everywhere, from deserts to very cold regions, they grow best in dark, warm and moist places. **Algae** - Algae are simple plant-like organisms that have cell walls and chlorophyll within the cells. They are usually photosynthetic but they do not have true roots, stems and leaves. Almost all the algae live in water. Some algae are found in snow and some in hot springs. They also grow in moist soil, barks of trees and rock surfaces. Though most algae are microscopic, some like seaweeds are quite large. Algae such as *Chlamydomonas* and *Chlorella* are unicellular whereas others such as kelp are multicellular.

Protozoa - Protozoa are unicellular and have animal-like characteristics. They can move from place to place. Some live in fresh and salt water while some live in damp places. Some examples of protozoa are paramecium, amoeba, giardia and entamoeba. Some protozoa are harmful as they cause serious diseases such as dysentery and malaria while others are helpful as they eat harmful bacteria. **Viruses** - Viruses are smaller than any other cell and much smaller than bacteria. They can be observed only under an electron microscope. They do not have a cellular structure like other micro-organisms. Outside a cell, they cannot reproduce, grow or use energy or respond to changes, which seem to suggest that they are non-living. In this state, they are called virions. But once they enter a living cell of an organism, they begin to reproduce just like a living cell, using the energy of the host for the purpose. The viruses are considered to be on the borderline of living and non-living. All viruses are parasitic.

2. The cyclic process of the fixing of nitrogen, which is used by plants and animals, and later returned to the atmosphere is known as nitrogen cycle.

Nitrogen cycle involves the following steps :

- Nitrogen fixation
- Nitrogen assimilation
- Ammonification, Nitrification
- Denitrification

Nitrogen fixation - The process of converting free atmospheric nitrogen gas into nitrogen compounds for the utilization of plant is called nitrogen fixation. In nature, it takes place in the following steps. **(a) Atmospheric Nitrogen Fixing** - Resulting in a reaction between nitrogen and oxygen to produce oxides of nitrogen. These dissolve in rainwater to form dilute nitric acid, which reacts with the alkalis of the soil, such as limestone, and turn into nitrates. **(b)** The conversion of atmospheric nitrogen into nitrogen compounds by living organisms is called

biological nitrogen fixation. Rhizobium, the nitrogen fixing bacteria. Fix atmospheric nitrogen into nitrates. **Nitrogen assimilation** - The process of conversion of inorganic compounds into organic compounds which become a part of living organisms is called nitrogen assimilation. **Ammonification** - When the plants and animal die, their remains are converted into ammonium salts and ammonia by decay bacteria and fungi (decomposers) present in the soil. This process of conversion of complex organic compounds, such as proteins, into ammonia is called ammonification. **Nitrification** - This process of conversion of ammonia into nitrates is called nitrification. **Denitrification** - Some of these nitrates are absorbed by the plants. The rest are converted into free nitrogen gas by denitrifying bacteria. This process is called denitrification.

- **3.** Bacteria are used to prepare some of our most common foods, curd and cheese.
- The bread that we eat every is also prepared by yeast.
- Some fungi are used as ingredients in some cheeses while some are used to make soy sauce.
- Chlorella, a unicellular green alga, is a rich source of minerals and vitamins.
- Some blue-green algae are also to fix atmospheric oxygen.
- Some bacteria decompose sewage and other wastes in water, thus keeping the environment free of pollution.
- Most of the oxygen on the earth was produced by the algae in the oceans.
- Certain types of bacteria are used to produce insulin, a hormone which controls the level of sugar in the blood. It is a daily requirement of people suffering from diabetes.
- Micro-organisms are used to make vaccines for diseases such as cholera, typhoid, tuberculosis, hepatitis, measles, polio, chickenpox and smallpox.
- Bacteria are useful in tobacco, leather and jute industries. Tanning is done with the help of bacteria.
- Certain bacteria also live in the intestines of humans which help to digest the food and also produce some vitamins needed by the human body.

4. They are harmful in many ways. Some of the micro-organisms cause disease in human beings, plants and animals. such disease-causing micro-organisms are called pathogens. Some micro-organisms also spoil food, clothing and leather. Pathogens enter our body through the air we breathe, the water we drink or the food we eat. They can also get transmitted by direct contact with an infected person or carried through an animal. Examples of such diseases include cholera, common cold, chicken pox and tuberculosis. Bacteria and viruses which infect the nasal passage, windpipe and lungs are present in the saliva and mucus. The virus may enter the body of a healthy person while breathing. Mosquitoes are the carriers of parasites causing malaria, dengue and yellow fever. Foods such as meat, chicken, eggs, milk, raw foods, unwashed vegetables, or sometimes, even cooked food may contain harmful micro-organisms such as bacteria or fungi. Consumption of such food may lead to a sickness called food poisoning. Anthrax is an infectious bacterial disease in sheep and cattle, which can also be transmitted to humans meat, wool, hair, skin, etc. of the affected animals. Distemper is a viral in dogs and cats. One of the most destructive diseases of wheat, rye and other grasses is black stem rust. Wheat and corn rust are also caused by fungi.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 3 Synthetic Fibres and Plastics

Let Us Answer

A. Multiple Choice Questions :

1. Cotton 2. Rayon 3. None of these 4. silky appearance 5. Teflon

B. Fill in the blanks :

1. Non-Cellulosic, Cellulosic 2. Coal, crude oil, natural gas, air, water etc. 3. Polymer 4. monomers 5. carbon

C. Write 'T' for true and 'F' for False statements :

1. F 2. T 3. F 4. F 5. T

D. Very short answer questions :

1. Stones, Wood, Clay, Cotton are natural materials used to manufacture human-made materials. 2. Petrochemicals or Petroleum is common sources of synthetic fibers. 3. Rayon is made from wood pulp. 4. Nylon is used to make strong ropes.

E. Short answer questions :

1. **Nature** - Cotton Silk, **Synthetic Fibres** - Rayon, Nylon 2. Rayon is not a pure synthetic fibre as it is made by the chemical treatment of a natural substance, cellulose. As the original raw material is broken down and then reformed, rayon is called regenerated fibre. 3. They do not absorb water or sweat, garments made of synthetic fibres are not very comfortable to wear in hot and sultry weather conditions. They also catch fire easily and hence are readily inflammable.

4. Plastic is polymer made of long chains of carbon and other elements. The word plastic is derived from the Greek word, plastikos, which means capable of being shaped or moulded. It is one of the most widely used materials today. Some most common uses of plastics are as follows :

- Tooth-brushes are made of plastic.
- Toys for children are made of plastic.
- Containers to store food items and water bottles are made of plastic.
- Various parts used in different modes of transport are made of plastic.
- Bodies of many electrical and electronic equipments are made of plastic.
- Plastic is also used a packing material.

F. Long answer questions :

1. For thousands of years, the cloth was only made from natural fibres such cotton, wool, jute and silk which were obtained from plants or animals, but these have some disadvantages. For example, cotton wrinkles, wool shrinks, silk is expensive to maintain and jute is harsh on the skin and not as durable. 2. Synthetic fibres and plastics are made up of molecules called polymers. Polymers are very large sized molecules which usually consist of long chains, made up of similar small molecules called monomers. Each small molecule is actually a chemical substance. The word 'polymer' comes from two Greek words, 'poly' meaning 'many' and 'mer' meaning 'part/unit'. So, a polymer is made of many repeating units called monomers. A single polymer may be made from up to 2, 00, 000 monomers. These are molecules of glucose. 3. **Nylon** - Nylon was the first non-cellulosic polymer or the first fully synthetic fibre as it was made without using any natural raw material (from plant or animal). It was prepared from coal, water and air. **Polyester** - Polyester is another synthetic fibre which is manufactured from petroleum products. It, as the name suggests, is a polymer of ester which is a chemical which gives fruits their smell. It has properties similar to those of nylon. Polyester has different varieties such as, terylene, terene and dacron. Terylene fibre is used to make fabrics. It is often mixed with natural fibres to make different varieties of fabrics. 4. **Thermoplastics** - The types of plastic which melt when heated and harden when cooled are called thermoplastics. The process of heating and cooling can be repeated again and again in thermoplastics, to soften the plastic and get different shapes. Some examples of thermoplastics are polyethylene, polypropylene, polystyrene, and polyvinylchloride (PVC). Thermoplastics have long and linear polymer chains which are connected to each other by

weak bonds. As soon as it is heated, the bonds are broken and re-form when the plastic object is cooled again. Thermoplastics are used in the manufacture of plastic wraps, food containers, water pipes, toys, plastic bags and lighting panels. **Thermosetting Plastics** - Thermosetting plastics or thermosets are plastics which are permanently 'set', once moulded into a shape i.e. they can be softened only once by heating. Once they are put into a mould and allowed to cool, they take that shape and cannot be softened on heating again. Two common examples of thermosetting plastics are melamine and bakelite. In thermosets, the linear polymer chains are cross-linked, which have a strong bond and heat does not have much effect on them. That is why, objects made of thermosets cannot be melted and re-formed. Thermosets are used to make handles of kitchen utensils, spatulas, plates, bowls, etc. They are also used in glues, varnishes, circuit boards, electrical switches, floor tiles, and heat-resistant fabrics.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 4 Metals and Non-metals

Let Us Answer

A. Let Us Answer

1. Zinc 2. in a free state 3. Mercury 4. Iron 5. basic oxides

B. Fill in the blanks :

1. reactive 2. electricity 3. more 4. hydrogen

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. F 4. F 5. F

D. Very short answer questions :

1. Mercury is liquid at room temperature 2. Mercury is a soft metal 3. Graphite found inside a pencil. 4. No non metal react with water

E. Short answer questions :

1. Reaction of metals with oxygen, water and acids demonstrate that metals have different activities. Potassium and sodium are most reactive while gold and silver are the least reactive. The arrangement of metals in decreasing order of reactivity is called reactivity series of metals.

Element	symbol	Reactivity
Potassium	K	Most reactive
Sodium	Na	
Barium	Ba	
Calcium	Ca	
Magnesium	Mg	
Aluminium	Al	
Zinc	Zn	Decreasing reactivity
Iron	Fe	
Nickel	Ni	
Tin	Sn	

Lead	Pb	
Hydrogen	H	
Copper	Cu	
Mercury	Hg	
Silver	Ag	
Gold	Au	Least reactive

2. Zinc does not react with water. Metal surfaces such as iron and steel are coated with a layer of zinc to prevent any contact between metal surface and moisture in the air, thus preventing rusting or corrosion. This process of coating the metal surfaces with zinc so as to prevent their rusting is called galvanization. **3.** Because non-metals are not ductile. **4.** The substances which produce a ringing sound when struck with a hard material, it is called sonorous. For example, when the bells in the school, temples or church are struck with a wooden mallet or some hard material, they produce a ringing sound.

F. Long answer questions :

1. Malleability - The property of a material to be beaten into sheets is known as malleability. That metals such as copper, aluminium iron, on being hammered or compressed, can be flattened to change into sheets. Thus, metals are malleable. This is how the aluminium foil, used for packing our tiffin, is made. Malleability is an important property as it allows metals to be moulded into different shapes. It usually increases on heating. **Ductility** - The property of a material by which it can be drawn into thin wires is known as ductility. Electrical wires are thin strands of copper and aluminium, which are metals. These thin strands can be turned and twisted easily without breaking. In general, metals can be drawn into wires. This shows that metals are ductile. Coal and graphite cannot be drawn into wires. This shows that non-metals are not ductile. **2.** Do it yourself **3.** Do it yourself

4. Uses of Metals - The uses of metals are related to their properties.

- Metals are used to make jewellery due to their hard and shiny appearance.
- Metals are used to make kitchen ware as they are good conductors of heat.
- Metals are full of strength and hence, are used as construction material to make homes, bridges, dams, etc.
- Metals are sonorous and so are used to make bells.
- Zinc is used to galvanize and so are used to make bells.
- Mercury is used in thermometers.

Uses of non-metals - Non-metals are used by humanity for a variety of purposes:

- Non-metals such as carbon, oxygen, hydrogen and nitrogen are essential for the sustenance of life.
- Oxygen is needed for respiration.
- Carbon dioxide is used by the plants to prepare food by photosynthesis.
- Carbon dioxide traps that heat and keeps the earth warm.
- Nitrogen and phosphorous are used by plants for their growth.
- Diamonds, because of their hardness and lustre, are used for cutting, drilling and in jewellery.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 5 Coal and Petroleum

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Wood 2. CNG 3. Electricity 4. carbon 5. Coal gas

B. Fill in the blanks :

1. Coal, Petroleum, natural gas 2. fractional distillation 3. Anthracite 4. refining 5. CNG

C. Write 'T' for true and 'F' false statements :

1. F 2. F 3. T 4. T 5. F

D. Very short answer questions :

1. Natural resources are Living 2. Coal, petroleum and natural gas are called fossil fuels as they were formed from the dead remains of living organisms (fossils). 3. Petrol, diesel are two components of petroleum which used as fuels. 4. Sun is the ultimate source of fossil fuels.

E. Short answer questions :

1. Renewable - Renewable resources are those resources which will either never run out or can be replenished or reproduced within a reasonable period of time through natural processes. Some examples of renewable resources are water, air, sunlight, plants and animals. For example, water in a well or a river may dry up but will be replenished as soon as it rains. **Non-Renewable** - Nonrenewable resources, which once exhausted, cannot be replenished within a reasonable period of time. Some examples of non-renewable resources are coal, petroleum, natural gas etc. They took millions of years to form and, if once used up, will take millions of years more to replenish. **2.** Fossil fuels are the backbone of our energy requirements. These are concentrated stores of energy which are used to cook food, run machines and vehicles and generate electricity. These are also used to power aeroplanes and rockets. **3.** Under extremely high pressure and temperature, dead plants got slowly converted to coal. As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonisation. Coal mainly consists of carbon, hydrogen, oxygen besides small amounts of sulphur and nitrogen. **4.** Petroleum was formed from organisms living in the sea. As these organisms died, their bodies settled at the bottom of the sea and got covered with layers of sand and clay over millions of years, absence of air, extremely high temperature and pressure transformed the dead organisms into petroleum and natural gas.

F. Long answer questions :

1. Some natural resources such as fossil fuels (coal and petroleum), forests, minerals etc. are exhaustible. The known reserves of all these resources will last, at the most, a few hundred years. Besides burning of fossil fuels is a major cause of air pollution. Their use is also linked to global warming. Hence, it is necessary to use them when absolutely necessary. This will result in better environment. Lesser risk of global warming and their availability for a longer period of time. **2.** The residue left behind during destructive distillation is called coke. It is a tough porous and black substance. It is an almost pure form of carbon. Coke is used in the manufacture of steel and in the extraction of many metals. It is also used to manufacture gaseous fuels such as producer gas, water gas etc. **3.** Save fuel for a better environment However there is a more important reason to conserve fossil fuels, and that's to help heal the environment burning Petroleum, coal and natural gas fills the air with harmful pollutants, including nitrogen oxide, sulfur dioxide, carbon dioxide, ozone, and a host of hydrocarbons. **4.** They are non-renewable sources of energy and are no longer available if once use excessive age of fossil fuels causes uncontrollable threat to environment like acid rain, global warming, air pollution and ozone layer depletion.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 6 Combustion and Flame

Let us Answer

A. Multiple Choice Questions (MCQs) :

1. Plastic 2. Crystallization 3. Wood 4. Water 5. None of these

B. Fill in the blanks :

1. Pollution 2. LPG 3. ignition temperature 4. Water 5. Water

C. Give Reasons for the following :

1. Water is not used in electrical fire as water conducts electricity and may harm those trying to douse the fire. It is also not used in case of oil or petrol fires as both oil and petrol are lighter than water, oil and petrol float on it and keep burning. 2. LPG too has a high calorific value and it produces no smoke and hence, it is preferred as a domestic fuel. Petrol is used in the transport sector. But these release harmful fumes which contribute to air pollution. 3. Do it yourself 4. The use of diesel and petrol as fuels in automobiles is being replaced by CNG (Compressed Natural Gas), because CNG produces very miniscule harmful products and its a cleaner fuel. 5. Do it yourself

D. Very short answer questions :

1. Combustion is the process of burning of substance with evolution of heat and light. 2. Carbon dioxide is produced when a fuel burns in sufficient supply of air. 3. The heat necessary to raise the temperature is less for alcohol than for water. 4. Burning carbon containing fuels called Suspended particulate matter (SPM) and they are harmful to lungs.

E. Short answer questions :

1. When we bring a burning matchstick or a gas lighter near a gas stove in the kitchen and turn on the knob of the gas stove, we observe that the LPG burns rapidly to produce heat and light. Such combustion is known as rapid combustion. 2. Do it yourself 3. To burn a heap of green leaves is difficult, because its ignition temperature is high, but dry leaves catches fire easily as its ignition temperature switches to low. 4. Goldsmith was the outermost zone of a flame forming gold and silver because it is the hottest zone and non-luminous in nature.

F. Long answer questions :

1. We generally have fireworks on Diwali and other festive days. On such occasions, when a cracker is ignited, a sudden reaction takes place with the evolution of heat, light and sound. A large amount of gas formed is liberated in the reaction. Such a reaction is called explosion. It (explosion) may also take place if pressure is applied on the cracker. 2. The simplest fire-extinguisher is the soda-acid fire extinguisher. It is in the shape of a metallic tube which is filled with highly compressed carbon dioxide. It makes use of the property of acids to react with metallic carbonates and bicarbonates to liberate carbon dioxide. When its lever is depressed, carbon dioxide is forced out at high pressure and brisk effervescence, and the fire is extinguished. The fire extinguisher is comprised of three parts: i. Container, ii. Bottle. The Container of the fire extinguisher is in the shape of a cylinder. It is filled with sodium bicarbonate solution while the small bottle attached to the knob is filled with concentrated sulphuric acid. 3. Do it yourself 4. The use of diesel and petrol as fuels in automobiles is being replaced by CNG (Compressed Natural Gas), because CNG produces very miniscule harmful products and its a cleaner fuel.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself.

Chapter - 7 Conservation of Plants and Animals

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Flora 2. Global warming 3. Aquarium 4. Red Data Book 5. Podo

B. Fill in the blanks :

1. a sanctuary 2. endemic 3. extinct 4. Gir National Park of Gujrat 5. Climatic

C. Differentiate between the following :

1. Sanctuary - A wildlife sanctuary is an area where animals are protected from any disturbance to them and their habitat. Hunting and poaching are prohibited in these areas by law. There are many wildlife sanctuaries in India which were designed keeping in mind the endangered animals and their habitats, the visiting places of migratory birds etc. **Biosphere reserve** - A biosphere reserve is a large area of protected land for conservation of wild life, plant and animal resources and traditional life of the tribals living in the area. As we are aware, biodiversity is the variety of plants, animals and micro-organisms generally found in an area. **2. Zoo** - Zoos are places wherer animals and birds are protected by keeping in cages or enclosures for public exhibition. They are feed and taken care by zoo authorities. **Sanctuary** - A wildlife sanctuary is an area where animals are protected from any disturbance to them and their habitat. Hunting and poaching are prohibited in these areas by law. There are many wildlife sanctuaries in India which were designed keeping in mind the endangered animals and their habitats, the visiting places of migratory birds etc. **3.** c If such species are not provided immediate protection, they may disappear from the earth forever i.e. become extinct. Two examples of animal species which became extinct are the dinosaur and the dodo. Though the dinosaur became extinct millions of years ago due to climate change, the extinction of dodo is a classic example of human wrought change i.e. hunting. Examples of some animals which ahve become extinct in the recent past are pine-hued duck, Sikkim stag and mountain quail of western Himalayas. Some animal species which have become endangered are Asiatic lion, beaver, bison, Indian elephant, leopard, pronghorn antelope, tiger and wild buffalo. **4.** The plants and animals found in a particular region are called its flora and fauna respectively. The biodiversity of an area is made up of its flora and fauna.

D. Very short answer questions :

1. This wide range of different kinds of organisms in an area constitutes its biodiversity. **2.** Flora refers to Plant **3.** Yes we are agree that forests help to check foods. **4.** Yes soil erosion to desert fication.

E. Short answer questions :

1. The plants and animals found in a particular region are called its flora and fauna respectively. The biodiversity of an area is made up of its flora and fauna. **2.** A major portion of the land needed to build new cities comes from forests. Cutting down of forests and using the land for other purpose is known as deforestation. **3.** As the changes in the environment increase due to changes wrought about by humans, many animals cannot adjust to these changes and begin to die. In addition, the populations of some species become very small and they become endangered. **4.** The government has designated separate protected areas for conservation of biodiversity in a particular area. These are known as biosphere reserves.

F. Long answer questions :

1. Conservation of forests is closely related to wildlife conservation. Whenever the destruction of any forest takes place, a large number of its resident animals become extinct or endangered.

Hence, in order to conserve endangered animals, the protection of forest acquires utmost importance. Hence certain steps need to be taken for wildlife conservation. Some such steps are as follows: **Habitat preservation** : To protect the habitat of wildlife helps to conserve it. Once such method of habitat preservation is to prevent deforestation. This is also done by reforestation which provides food and shelter for wildlife. **Hunting regulations** : Another important method of wildlife preservation are various government resolutions on hunting and their effective implementation. Hunting and poaching of endangered animals is completely banned by law and any violation attracts stringent punishment. **2. Do it yourself**

3. A major portion of the land needed to build new cities comes from forests. Cutting down of forests and using the land for other purpose is known as deforestation. Trees in the forest are cut for some of the purposes mentioned below :

- To build, homes, roads, factories, dams and other infrastructure.
- Producing land for cultivation as more and more food is needed for an ever burgeoning population.
- For mining of minerals such as coal, petroleum and ores.
- For timber and wood used in construction, as fuel, making furniture, home fittings and railway sleepers.

4. It maintains and assesses the conservation status of such species around the world so as to highlight it further and make the people aware. The endangered species are compiled in Red List. The agency also maintains a Red Data Book which is the source book on population status of all the endangered animals and plants in the Red List. There are different Red Data Books for plants, animals and other species. The species mentioned in the Red Data Book are classified into categories as per the risk of extinction they face such as 'extinct', 'critically endangered', 'endangered' and 'vulnerable'.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 8 Cell Structure and Functions

Lets Us Answer

A. Multiple Choice Questions (MCQs) :

1. Mushroom 2. Amoeba 3. Cell 4. Cell membrane 5. Lysosome

B. Fill in the blanks :

1. 1665 2. Hens egg 3. Cytoplasm 4. Prokaryotic cell 5. Plastids

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. F 4. T

D. Very short answer questions :

1. Egg of an Ostrich is the largest single cell.
2. Cytoplasm .is the jilly like substance present in cell.
3. Mitochondria, Chloroplast organelles which formed by need all help to get energy from food.
4. Daughter cells or Parent cell

E. Short answer questions :

1. Protein because they are the components of each cell organelle and work as enzyme also. 2. The cytoplasm is a jelly-like substance which makes up most of the inside of a cell. There are many chemicals in it which are involved in various reactions. All the life functions are carried out here as

many cell organelles such as nucleus, mitochondria, endoplasmic reticulum, Golgi apparatus, ribosomes etc. **3.** The entire content of a living cell, including both the nucleus and the cytoplasm, is known as protoplasm. **4.** Small structures called organelles are found scattered in the cytoplasm. These organelles are of various kinds which perform different functions. Some such organelles Mitochondria, Plastids, Ribosomes, Lysosome, E.R., Vacoules, etc.

F. Long answer questions :

1. Mitochondria are small rod-shaped organelles. These are called the powerhouse of the cell as they are the site of respiration and oxidize food to provide energy. The number of mitochondria in a cell depends upon the function it carries out.

2. Difference b/w Prokaryotic & Eukaryotic cell -

2.	S.No.	Prokaryotic	S.No.	Eukaryotic
	1.	Respiration process complete is mesosome	1.	Complete in mitochondria.
	2.	Nuclear body is in the form of Nucloid.	2.	Present true nucleus.
	3.	Vacuole is Absent	3.	Present
	4.	Circular DNA in hereditary material.	4.	Linear DNA is hereditary material.
	5.	Ribosomes are 70S type generally.	5.	both 70S and 80S type.
	6.	Photosynthesis process complete in internal membrane (chloroplast absent)	6.	Photosynthesis process complete in chloroplast.
	7.	Golgi bodies, E.R., are absent.	7.	Both are present.
	8.	Lysosome is Absent	9.	Present

3. Functions of Vacuoles - Vacuoles can serve a wide variety of functions in a cell, and their importance depends on what role they play within the cell. Typically their job includes isolating harmful material storing waste products storing valuable water in a plant cell, helping, maintain the pressure within a cell, balancing the pH of a cell, exporting products out of the cell and storing proteins for seed germination.

4.	S.No.	Plant Cell	S.No.	Animal Cell
	1.	A plant cell is usually larger in size.	1.	An animal cell is comparatively smaller in size.
	2.	It cannot change its shape.	2.	An animal cell can often change its shape.
	3.	A mature plant cell contains a large central vacuole.	3.	An animal cell often possesses many small vacuoles.
	4.	Plasmodesmata is present.	4.	Absent
	5.	Reserve food is generally in the form of starch.	5.	Reserve food is usually glycogen.
	6.	It generally has one or two large vacuoles.	6.	Vacuoles are either absent or are very small.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 9 Reproduction in Animals

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Ovaries 2. Earthworm 3. uterus 4. embryo 5. 10-15 yrs

B. Fill in the blanks :

1. sexual, asexual 2. Binary fusion, Budding, Cloning 3. assisted reproductive 4. Zygote 5. changes

C. Write 'T' for true and 'F' for false statements :

1. T 2. T 3. T 4. F

D. Very short answer questions

1. Fertilization is the process of fusion of sperms and egg. 2. external is the fertilization in frogs. 3. Puberty is the onset of sexual maturity in the animals. 4. oviduct is produced ovum in humans.

E. Short answer questions :

1. Human reproduction requires two sexes, the male and the female. Both the sexes have different reproductive systems. The fertilization takes place internally and the zygote develops into a fully formed individual inside the body of the female only. 2. If the ovum is not fertilized by the sperm, it is expelled from the uterus along with some uterine muscles and blood. This is known as menstruation. 3. Fertilization results in the formation of zygote which begins to develop into an embryo. The zygote divides repeatedly to give rise to a ball of cells. This process is called cell division. 4. This transformation of the larva into an adult through drastic changes is called metamorphosis.

F. Long answer questions :

1. The ovum and the sperms meet in the oviduct. When sperms come in contact with an egg, one of the sperms may fuse with the egg. Such as fusion of the egg and the sperm is called fertilization. During fertilization, the nuclei of the sperm and the egg fuse to form a single nucleus. This results in the formation of a fertilized egg or zygote thus marking the beginning of a new individual. 2. The process of creating an exact copy of a biological entity is called cloning. A clone is created by inserting the complete genetic material of a regular body cell from a donor into a recipient. The first cloned mammal which was genetically identical to its parent was Dolly, which was created in 1996. 3. Fertilization which takes place inside the female body is called internal fertilization. Internal fertilization occurs in many animals including humans, cows, dogs and hens. Internal fertilization takes place in earthworms as well but as it is a hermaphrodite, an earthworm does not fertilize itself. Two earthworms come together and exchange sperms. This leads to the fertilization of the eggs. 4. Amoeba is a simple single-celled organism which reproduces by this method. The process of reproduction process begins with the duplication and division of its nucleus into two nuclei. This is followed by the division of the cytoplasm and its body into two. each part receiving a nucleus. Finally, two identical amoebae are produced from one parent amoeba.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 10 Reaching the Age of Adolescence

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Growth **2.** Penis **3.** proper diet is needed for the rapid growth in the body **4.** menstruation begins **5.** chapati, dal and vegetables.

B. Fill in the blanks :

1. endocrine **2.** testosterone **3.** puberty **4.** X4 **5.** Chips, Pizza, Burger

C. Write short notes on :

1. At puberty, the voice box or the larynx begins to grow Boys develop larger voice boxes. The growing voice box in boys can be seen as a protruding part of the throat called Adam's apple. **2.** The sex characteristics mentioned above, the release of the sex hormones brings about the secondary sex characteristics. **3.** The instruction for determining the sex of the baby, whether it is going to be a girl or a boy, lies inside the fertilized egg or zygote. It is present in the thread-like structures, known as chromosomes, in the fertilized eggs. You have already learnt that chromosomes are present inside the nucleus of every cell. All human beings have 23 pairs of chromosomes in the nuclei of their cells. In each pair, one chromosome comes from the father and one from the mother. Two chromosomes out of these are the sex chromosomes, named X and Y. A female has two X chromosomes, while a male has one X and one Y chromosome. Each gamete (egg and sperm) has only one chromosome. While the egg has an X chromosome, the sperm may have an X or Y chromosome. When a sperm containing X chromosome fertilizes the egg, the zygote would have two X chromosomes and develop into a female child. If the sperm contributes a Y chromosome to the egg (ovum) at fertilization, the zygote would develop into a male child. **4.** Physical exercise is very necessary for everyone, more so for adolescents. Walking and playing in fresh air keeps the body fit and healthy. All young boys and girls should take walks, exercise and play outdoor games.

D. Very short answer questions :

1. No all parts of the body grow at same rate during adolescence. **2.** in boys 13-16, in girls 10-15 the puberty begins in boys and girls age. **3.** Menopause is between two menstrual cycles. **4.** 23 pair in the nuclei of their cells.

E. Short answer questions :

1. Hormones regulate many processes such as growth, development, reproduction and behaviour. Each hormone has its own specific function and is required in very small quantity. **2.** Adrenaline Helps the body to adjust to sudden stress by increasing blood pressure. **3.** The pituitary gland is the master endocrine gland as a hormone secreted by it controls the production of all these hormones. **4.** The transformation of the larva into an adult through drastic changes is called metamorphosis.

F. Long answer questions :

1. Adolescence is a period of much activity in the body and mind which is a normal part of growing up and individuals tend to feel confused and insecure. It is easy to be lured astray by wrong company and advice. Such individuals may become addicted to intoxicants and drugs. Drugs are addictive. If an individual may become addicted to intoxicants and drugs. Drugs are addictive. If an individual takes them even once, he/she feels like taking them again and again, leading to addiction. This addiction to such substances is destructive which leads to ruination of health, happiness and ultimately, the individual's family. **2.** The reproductive phase of life begins at puberty (10 to 12 years of age) and generally lasts till the age of approximately 45 to 50 years. The ova begin to mature with the onset of puberty. Once ovum matures and is released by one of the ovaries once in about 28 to 30 days. During this period, the wall of the uterus becomes thick so as to receive the egg, in case it is fertilized and begins to develop. This leads to pregnancy. If the fertilization does not occur, the released egg and thickened lining of the uterus along with its blood vessels are shed off. This causes bleeding in women which is known as menstruation, which occurs once in about 28 to 30 days. The first menstrual flow begins at puberty and is called menarche. When the female is between the ages of 45 to 50 years of age, the menstrual cycle stops. The

stoppage of menstruation is called menopause. **3.** The instruction for determining the sex of the baby, whether it is going to be a girl or a boy, lies inside the fertilized egg or zygote. It is present in the thread-like structures, known as chromosomes, in the fertilized eggs. You have already learnt that chromosomes are present inside the nucleus of every cell. All human beings have 23 pairs of chromosomes in the nuclei of their cells. In each pair, one chromosome comes from the father and one from the mother. Two chromosomes out of these are the sex chromosomes, named X and Y. A female has two X chromosomes, while a male has one X and one Y chromosome. Each gamete (egg and sperm) has only one chromosome. While the egg has an X chromosome, the sperm may have an X or Y chromosome. When a sperm containing X chromosome fertilizes the egg, the zygote would have two X chromosomes and develop into a female child. If the sperm contributes a Y chromosome to the egg (ovum) at fertilization, the zygote would develop into a male child. **4.** AIDS, the most widespread killer of modern times, is caused by a dangerous virus, HIV. This virus can pass on to a normal person from an infected person by sharing the syringes used for injecting drugs. It can also be transmitted to an infant from the infected mother through her milk. The virus can also be transmitted through sexual contact with a person infected with HIV.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 11 Force and Pressure

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. decrease 2. increases 3. gravity 4. lying down 5. become half

B. Fill in the blanks :

1. pull 2. attract 3. pull 4. repel

C. In the following situations, identify the agent exerting the force and object on which it acts. Also, state the effect of the force in each case.

Do it yourself

D. Very short answer questions :

1. Yes all pushes and pulls are forces 2. Force has effect on both the shape & state of motion of bodies. 3. Yes only earth exerts gravitational force on object 4. Electrostatic force is exerted by an electrostatic charge.

E. Short answer questions :

1. The contact of our foot with the football gives rise to the force which moves it. Squeezing the rubber ball involves the interaction between the ball and the hand. 2. It depends on its direction. 3. The magnets move towards each other due to attraction and they move away from each other due to repulsion.

F. Long answer questions :

1. A push or a pull on an object is called a force. Thus, we can say that the motion imparted to above objects was due to the action of a force. To understand it better. Let us revisit the earlier examples. The hammer exerts a force on the nail, the moment it touches it. squeezing the rubber ball involves the interaction between the ball and the hand. Unit of Force - The unit of force is newton (N), named so after Sir Isaac Newton. Another unit of force is kilogram weight (kg-wt). where 1 kg-wt. = 9.8 N. 2. **Contact Forces** - The interacting objects have to be in contact for the forces to come into play. All such forces are called contact forces. The examples of contact forces are muscular force and friction. **Muscular Force** - This force is caused by the action of muscles in

our body. The force resulting due to the action of muscles is known as the muscular force. Animals such as bullocks, horses, donkeys, and camels perform various tasks for us. They make use of muscular force to perform these tasks. **Magnetic Force** - The force which is exerted by a magnet on another magnet or magnetic material is known as magnetic force. **3.** The force responsible for changing the state of motion of objects in all these situations is the force of friction. The force of friction between the surface of the ball and the ground brings the moving ball to rest. Similarly, friction between water and the boat brings it to a stop once you stop rowing. **4.** Pressure exerted by Liquids - Take an ink dropper and hold it inside a transparent bucket of water. Now, press the dropper to release the air in it. Observe the air bubbles as they move to the surface of water. You will observe that the size of the air bubbles increase as they move towards the surface. This is because of the decrease in the pressure exerted by the water on them. Once the bubbles reach the surface, they burst. From the above activities, we can conclude that :

- Liquids exert pressure equally in all the directions.
- The pressure at a given level is the same on all the points.
- The pressure inside a liquid increases with an increase in depth.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 12 Friction

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. always advantages 2. friction is less 3. roughen the surface 4. Applying brakes 5. rolling friction, sliding frictions

B. Fill in the blanks :

1. relation motion 2. nature 3. heat 4. smaller

C. Write 'T' for true and 'F' for false statements :

1. T 2. T 3. F 4. F

D. Very short answer questions :

1. Non-contact force is friction 2. Its motion always oppose 3. Friction occurs due to the roughness of the surface in contact. 4. No friction does not cause a loss of energy

E. Short answer questions :

1. Roll a football in the playground and observe its motion. You will see that the ball stops on its own after some time though no external force was applied in it. This activity shows that there might be a force which acts on the football and opposes its motion. This is called the force of friction or just friction. 2. Rolling friction. 3. The substances which reduce friction are called lubricants. In some machines, it may not be advisable to use oil as lubricant and in such cases, an air cushion between the moving parts is used to reduce friction. 4. The shoes which we wear daily. Their soles of our shoes are grooved so as to provide the shoes better grip on the floor, so that we can move safely.

F. Long answer questions :

1. As an object rolls over a surface or another object, a force resists it. It is called rolling friction. To understand it, let us repeat activity 3 but putting some pencils under the brick. As the brick begins to move, the pencils too begin to move. Note the reading on the spring balance. We observe that the force needed to move the brick now is much smaller. Thus, rolling an object reduces the

friction and makes its motion easier. Hence, we can conclude that rolling friction is less than sliding friction which itself is smaller than static friction. **2.** In the first case, the three caps prevent the motion of each other, thereby the movement of the object is difficult. In the second case, filling marbles between the caps changed the static friction between them to rolling friction which, as we know, is much smaller than static or rolling friction. Hence, application of even a small force makes the heavy object move easily. In this activity, the usage of marbles between the moving parts is similar to the metallic balls used between the moving parts of a machine. These are also known as ball bearings. It reduces the friction and thereby makes the movement of machine parts smooth and easy. It also prolongs the life of the machine. Though, it requires much effort to reduce friction, it is a necessary evil and in many cases, works to our advantage. **3.** Water and other liquids also exert force of friction when the objects move through them. As we are aware, the common name of gases and liquids is fluids. So we can conclude that fluids exert force of friction on objects in motion through them. The frictional force on an object in a fluid depends on its speed with respect to the fluid. It also depends on the shape of the object and the nature of the fluid. **4.** Efforts are made to minimize friction. For this reason, objects are given special shapes. The special shapes of living beings such as fish and birds were given to them by nature as they have to move about in fluids all the time. Their bodies have evolved over time and acquired the shapes which would prevent the loss of much energy in overcoming friction. Their shapes gave the initial idea to scientists in designing the shapes of aircrafts, boats, ships etc. The shape of an aircraft is similar to the shape of a bird. Such shapes are called aerodynamic or streamlined. In fact, all vehicles are designed to have shapes which reduce fluid friction.

Group Discussion

Do it yourself

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 13 Sound

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. solids, liquids and gases **2.** Baby girl **3.** Air **4.** amplitude

B. Fill in the blanks :

1. Frequency **2.** square of amplitude **3.** one oscillation per second **4.** noise

C. Write 'T' for true and 'F' for false statements :

1. T **2.** F **3.** F **4.** T

D. Very short answer questions :

1. A vibrating object produces sound. **2.** The loudness of sound depends on its amplitude. **3.** Inaudible sounds for 'number of vibration per seconds'. **4.** Audible sounds produced by irregular vibration.

E. Short answer questions :

1. Muscles attached to the vocal cords can make the cords tight or loose. When the vocal cords are tight and thin, the type or quality of voice is different from that when they are loose and thick. Our tongue, cheeks and lips too contribute in producing different kinds of sounds. **2.** Any sound with a frequency less than 20 Hz is called infrasound while any sound with a frequency more than 20 kHz is called ultrasound. **3.** The sound is propagated by vibrations which occur in the particles of any medium about a mean position. The maximum distance travelled by these particles on either side of the mean position is the amplitude of a sound. **4.** A frequency of 1 Hz is one oscillation per second.

F. Long answer questions :

1. The sound is produced by the voice box or the larynx. Put your fingers on the throat and find a hard bump that seems to move when you swallow. This part of the body is known as the voice box. It is at the upper end of the windpipe. Two vocal cords are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the passage of air. **2.** In the music room of our school there are different stringed musical instruments such as ektara, guitar, sitar, violin etc. These instruments are called so as they have strings attached to them and when these strings are plucked, they produce sounds. Other musical instruments such as drums, dholak, tabla, mrindagam etc. have stretched membranes. When these membranes are struck, they vibrate and the musical instruments produce sounds. Instruments such as a flute or a trumpet produce sounds when the air column inside them vibrates. **3.** The presence of unwanted gases and particles in air is called air pollution. The presence of excessive or unwanted sounds in the environments called noise pollution. Some major causes of noise pollution are sounds of vehicles, explosions including bursting of crackers on festivals such as Diwali, machines, loudspeakers etc. The presence of excessive noise in the surroundings may give rise to many health related problems. Some such health problems are a lack of sleep hypertension anxiety lack of concentration and a decrease in efficiency. The hearing of a person who is exposed to a loud sound continuously may get temporarily or even permanently impaired. Noise pollution needs to be controlled in residential areas as well. This can be attained by conducting noisy operation away from the residential areas. The noise producing industries should be set up away from such areas. Use of automobile horns should be minimized. TV and music systems should be run at low volumes. Trees must be planted along the roads and around buildings to cut down on the sounds reaching the residents, thus reducing the harmful effects of noise pollution. **4.** The voice of a child has a higher frequency than that of an adult. Hence, the children have shriller voices. As the voice of a woman has a higher frequency, it is shriller than that of a man.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 14 Chemical Effects of Electric Current

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. electrochemical cell **2.** Distilled water **3.** None of these **4.** Mercury

B. Fill in the blanks :

1. acid, base, salts **2.** chemical **3.** negative **4.** electroplating

C. Give reasons for the following :

1. Water should not be used on an electrical fire because water conducts electricity and can cause a shock. **2.** Tin cans, used for storing food, are made by electroplating tin onto iron. Tin is less reactive than iron. Thus, food does not come into contact with iron and is protected from getting spoilt. **3.** Iron is used in bridges and automobiles to provide strength. However, iron tends to corrode and rust. So, a coating of zinc is deposited on iron to protect it from corrosion and formation of rust. **4.** Distilled water is free of salts and is a poor conductor. But, when we add salt to it, it begins to conduct. This demonstrates that distilled water (water lacking salt) is a poor conductor of electricity but the salt solution is a good conductor of electricity. Distilled water also begins to conduct when a chemical substance such as sodium hydroxide or dilute hydrochloric acid is added to it.

D. Very short answer questions :

1. Yes it flows from the positive to the negative **2.** Yes battery used as a driving force in electric circuit. **3.** No all metal are not good conductor. **4.** Yes all expensive metals protected by electroplating.

E. Short answer questions :

1. The flow of electric charge through a conductor is called electric current or electricity. **2.** Which allow electric current to pass through them, are good conductors of electricity. All the metals are supposed to be good conductors of electricity but some materials such as silver, copper, aluminium and gold are able to conduct electricity better than the other materials. On the other hand, the materials or substances, which do not allow electric current to pass through them easily, are poor conductors of electricity or insulators. Some examples of insulators are rubber, plastic, glass and wood. Both the conductors and the insulators are used widely in our everyday life. **3.** Such liquids which allows the electric current to pass through them are called conducting liquids or electrolytes.

F. Long answer questions :

1. The underground water that we get from sources such as taps, hand pumps, wells and ponds is not pure. It may contain several salts dissolved in it. Small amounts of mineral and salts are naturally present in it. This water is thus a good conductor of electricity. On the other hand, distilled water is free of salts and is a poor conductor. But, when we add salt to it, it begins to conduct. This demonstrates that distilled water (water lacking salt) is a poor conductor of electricity but the salt solution is a good conductor of electricity. Distilled water also begins to conduct when a chemical substance such as sodium hydroxide or dilute hydrochloric acid is added to it. **2.** When the free ends of the wires are dipped in certain liquids, the bulb glows. These liquids allow the current to flow through them, thus completing the circuit. Such liquids which allows the electric current to pass through them are called conducting liquids or electrolytes. The electrical conduction through is called electrolytic conduction. When the liquid does not allow the electric current to pass, the circuit of the tester is not complete and the bulb does not glow. Such liquids are called poor conductors of electricity. In some situations, even though the liquid is conducting, the bulb may not glow. Due to the heating effect of current. **3.** The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating. It is one of the most common applications of chemical effects of electric current. **4. Applications chemical effect f current** - Electroplating is a very useful process. It is widely used in industry for two main reasons : **(a)** To coat metal objects with a thin layer of a different metal so as to protect the metal underneath. **(b)** To produce an attractive finish on the coated metal. The layer of metal deposited has some desired property, which the metal of the object lacks. For example, chromium plating is done on many objects such as car parts, bath taps, kitchen gas burners, bicycle handlebars, wheel rims, etc. Chromium has a shiny appearance and it does not corrode. Besides, it also resists scratches. However, chromium is expensive and it may not be economical to make the whole object out of chromium. Hence, the object is made from a cheaper metal and only a coating of chromium is deposited over it. Jewellery makers electroplate silver and gold on less expensive metals.

Group Discussion

Do it yourself

Creative Activities

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HOTS Questions

Do it yourslef

Chapter - 15 Some Natural Phenomena

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. conductors 2. an uncharged body 3. Richter scale 4. electric charge comes between cloud and the ground

B. Fill in the blanks :

1. attracts 2. Induction 3. friction 4. Richter scale

C. Write 'T' for true and 'F' for false statements :

1. T 2. T 3. T 4. F

D. Very short answer questions :

1. Because of charging by friction the comb attract piece of paper. 2. In contrast to the attract between two object with opposite charges two objects that are of light charge will repel each other. 3. After repulsing between two bodies body get charged so it is said that only repulsion is a short test of charge on a body. 4. How to check whether a body is charged or not? This is done by using a device called electroscope.

E. Short answer questions :

1. The negative charge meets the positive charge on the ground, flashes of bright light and loud thunder occurs. These bright flashes are referred as lightning while the process is called electric discharge. 2. The copper wire on the surface of the electroscope is connected to the earth, the accumulated negative charge accumulated on the surface moves to the earth. This movement of charge from the object to the body is called earthing. 3. To protect all buildings from damage from lightning, a lightning conductor is fixed on top of them. The ideas to use lightning conductors on top of tall buildings to protect them was developed by Benjamin Franklin. A lightning conductor consists of a metal rod which ends in spikes at the top. The lower end of the rod is attached to a copper plate which is buried deep in the earth.

F. Long answer questions :

1. The positive charges accumulate close to the upper edge of the cloud while the negative charges accumulate close to the bottom edge. This leads to the rearrangement of the charges on the ground surface where the positive charges collect close to it. The flow of charges from the clouds to the ground is prevented by air as it is a bad conductor of electricity. But when the magnitude of the charges becomes high, the air gets ionized and the charges flow through it. As the negative charge meets the positive charge on the ground, flashes of bright light and loud thunder occurs. These bright flashes are referred as lightning while the process is called electric discharge. This may occur between the cloud and the earth, between two oppositely charged clouds or between two oppositely charged parts of the same cloud. 2. Lightning also leads to the formation of ozone from oxygen, which is present in the atmosphere as ozone layer and prevents the harmful ultraviolet rays from coming down to the surface of the earth. 3. Vibration or shaking of the earth surface is called an earthquake. An earthquake may be caused by volcanic eruptions, plate tectonics, underground nuclear explosions, or a meteor strike. The most common ones are caused by plate tectonics. These occur when the rocks in the earth's crust break due to the geological forces created by the motion of the tectonic plates. 4. Sometimes, earthquakes, which occur on sea beds, may give rise to tsunamis, which hit coastal areas and cause large scale destruction. An earthquake begins from the focus which is its starting point. The point immediately above the focus is called the epicenter of the earthquake. The weak zones on the surface of the earth where the earthquakes are most likely to occur are called fault lines or seismic zones. The waves generated by the earthquake are called seismic waves. These travel at different speeds. While some of these waves make the ground ripple up and down, others shake it from side to side.

Group Discussion

Do it yourself.

Creative Activities

Do it yourself.

HOTS Questions

Do it yourself

Chapter - 16 Light

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. black 2. reflect the light of the sun 3. always 4. virtual, behind the mirror and of the same size as the object.

B. Fill in the blanks :

1. 2 2. left 3. left hand 4. large 5. less

C. Write 'T' for true and 'F' for false statements :

1. T 2. F 3. F 4. T

D. Very short answer questions :

1. When we throw a ball at a wall, it bounces back straight at us. This is exactly how light bounces back when it falls on a surface. This bouncing back of light from a surface is called reflection of light. 2. In water light will bend more because the bending occurs because light travels more slowly in a denser medium. 3. Phenomenon where the white light splits into its constituent colours is called dispersion. 4. Sunlight is a white light.

E. Short answer questions :

1. Take a white sheet and write E on it in large size. Hold the sheet in front of the mirror and look at the image of the letter E. We find that the right side of the letter appears on the left side in the image while the left side appears on the right. This is known as lateral inversion. 2. It consists of seven colours like violet, indigo, blue, green, yellow, orange and red is referred to as VIBGYOR. 3. At the junction of the optic nerve and the retina, there are no sensory cells, hence no vision is possible at this spot. This is called the blind spot. 4. **Laws of Reflection** - There are two laws of reflection. These are as follows : (i) The angle of incidence is always equal to the angle of reflection. (ii) The incident ray, the normal at the point of incidence and the reflected ray all lie in the same plane.

F. Long answer questions :

1. This reflection of light enables us to see non-luminous objects. When light from a luminous object falls on a non-luminous object, it is reflected back. As this reflected light reaches us, we are able to see the object. For example, the moon is a non-luminous heavenly body. We are able to see it because it reflects the sunlight on to the earth. 2. When we go to a hair salon for a haircut, the hair dresser makes us sit in front of a mirror. After the hair cut is over, he places a mirror at our back and shows how the hair has been cut. But how could we see the hair at the back of our head? This is made possible by the use of multiple reflections. It reflects to reflecting a ray of light more than once. Here, more than one mirror is used. The concept of multiple reflections is used in the construction of a periscope which is used in submarines, tanks and also by soldiers in bunkers to see things outside. 3. First, we take the cardboard with both ends open, which we cut as shown in the figure given below. Then we fix the mirrors at the cut ends with the cello tape. These mirrors should make an angle of 45° with the vertical. Then we make square holes of 3 cm x 3 cm in front of the mirrors. Our periscope is ready. Now, we hold the periscope vertically so that the upper hole points at an object at a higher level and look through the lower hole. Can we see the object? 4. A kaleidoscope is a tube of mirrors which contains loose coloured beads or glass pieces. The light enters from the end containing the coloured pieces and gets reflected around. This light is further reflected multiple times by the mirrors inside the tube and it finally enters the eye which is placed at the other end of the tube. As the mirrors are hinged, multiple images of an object are created.

Various combinations of these multiple images form a variety of patterns. We can also make a kaleidoscope by performing the following activity. An interesting feature of a kaleidoscope is that we will never see the same pattern again. A kaleidoscope is used by wallpapers and fabric designers and artists to get ideas for new patterns.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

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Chapter - 17 Stars and the Solar System

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Mercury 2. An asteroid 3. Sirius 4. we can see only that part of the moon which reflects light towards us.

B. Fill in the blanks :

1. galaxy 2. solar system 3. Star 4. Mars, Jupiter

C. Write 'T' for true and 'F' for false statements :

1. F 2. T 3. F 4. F

D. Very short answer questions :

1. Western sky after sunset Venus is as visible as a living star. 2. Jupiter is the largest planet of the solar system. 3. A group of stars is called constellation. 4. The sun, comets are members of solar system.

E. Short answer questions :

1. The Sun and the celestial bodies which revolve around it form the solar system. It consists of a large number of bodies such as planets, comets, asteroids and meteors. 2. Venus appears in the eastern sky before sunrise while at other times, it appears in the western sky just after sunset. Hence, it is often called morning or an evening star, although it is not a star. Rotation of Venus on its axis is somewhat unusual as it rotates from east to west. Observing Venus through a telescope reveals that it shows phases just like the moon. Its distinct features are as follows :

- It too has no satellite of its own.
- It is the hottest planet of the solar system.
- It is the brightest object in the sky.

3. The only natural satellite of the earth is the moon. Its radius is about one fourth that of the earth. Its surface is dusty and barren. It also has a large number of steep and high mountains. Some of these are as high as the highest mountains on the Earth. The mass of the moon is $1/81$ th that of the earth and hence, its gravity is about $1/6$ th that of the earth. The moon has no atmosphere and no water. 4. Halley's Comet.

F. Long answer questions :

1. Some special environmental conditions are responsible for the existence and continuation of life on the Earth. These include just the right distance from the sun, so that it has the right temperature range, the presence of water and suitable atmosphere and an ozone layer or major factors. 2. Watch Ursa Major repeatedly on a clear moonless summer night at regular intervals of 2 hours. You will observe that Ursa Major appears to revolve around the pole star. In fact, all the stars appear to revolve around the Pole star. 3. The sun and the stars appear to move from east to west, it means that the earth rotates on its axis from west to east. But there is one star which appears stationary from the earth. This is the pole star (Dhruv Tara). Why does it appear

stationary? Let us perform the following activity to find this. Take an umbrella and open it. Make about 10-15 stars out of white paper. Paste one star at the position of the central rod of the umbrella and others at different places on the cloth near the end of each spoke. Now rotate the umbrella by holding its central rod in your hand. Observe the stars on the umbrella. We observe that there is a star which does not appear to move, which is located on the central rod of the umbrella. This means that if there were a star located where the axis of rotation of the earth meets the sky, this star also could be stationary. The pole star is situated in the direction of the earth's axis. It does not appear to move. This is what makes it useful for navigational purposes. **4.** The astronomers use special units to measure different distances in space. Here, they use a special unit called light year, instead of a kilometer. A light year is the distance travelled by light in a year. The speed of light is 3,00,000 km/s. Hence, 1 light year = $3,00,000 \times 365 \times 24 \times 60 \times 60 \text{ km} = 9.5 \times (10) \text{ km}$.

Group Discussion

Do it yourself

Creative Activities

Do it yourself

HOTS Questions

Do it yourself

Chapter - 18 Pollution

Let Us Answer

A. Multiple Choice Questions (MCQs) :

1. Chlorine 2. Ozone 3. All of these 4. Chlorine

B. Fill in the blanks :

1. Sulphuric nitric 2. Co_2 3. global warming 4. bacteria, parasites etc, Cholera typhoid

C. Write 'T' for true and 'F' for false statements :

1. F 2. F 3. T 4. T

D. Very short answer questions :

1. Chlorination is process of purified water. 2. No water dose not discharge from industries. 3. Yes we drink people water. 4. Yes Co_2 the only green house gas.

E. Short answer questions :

1. Many a times, untreated sewage is thrown directly into rivers. It contains food wastes, detergents, microorganisms, etc. All these contribute to pollution of groundwater. Water contaminated with sewage may contain bacteria, viruses, fungi and parasites which cause diseases like cholera, typhoid and jaundice. 2. Acid rain 3. CNG 4. Catalytic converter are used in exhaust system to provide a site for the oxidation and reduction of toxic by products of fuel into less hazardous substances such as carbon dioxide, water vapour and nitrogen gas.

F. Long answer questions :

1. At Kanpur, the amount of water is comparatively small and the flow of the river is very slow. In addition, Kanpur has more than 5000 industries. These include fertiliser, detergent, leather and paint industries. These industrial units discharge toxic chemical wastes into the river.

2. Given below are some ways to make the water safe for consumption :

- Filtration is a physical method of removing impurities. Two popular household filters are candle type filter and RO Purifiers.
- Many households use boiling as a method for obtaining safe drinking water. Boiling kills the germs present in the water.

- Chlorination is a commonly used chemical method for purifying water. It is done by adding chlorine tablets or bleaching powder to the water. But one must be cautious and should not use more chlorine tablets than specified.

3. The industries located in and around Agra like rubber processing, automobile, chemicals, brick kilns and especially the Mathura Oil Refinery, have been responsible for producing pollutants like sulphur dioxide and nitrogen dioxide. These gases react with the water vapour present in the atmosphere to form sulphuric acid and nitric acid. The acids come down the earth with rain, making the rain acidic. This is called acid rain. Acid rain corrodes the marble of the monument. The phenomenon is also called “Marble Cancer” Suspended particulate matter, such as the soot particles emitted by Mathura Oil Refinery, has contributed towards yellowing of the marble. **4.** The sources of air pollutants are factories, power plants, automobile exhausts and burning of firewood and dung cakes. Many respiratory problems are caused by air pollution. Carbon monoxide is produced from incomplete burning of fuels such as petrol and diesel. It is a poisonous gas. It reduces the oxygen-carrying capacity of the blood. Smoke may contain oxides of nitrogen which combine with other air pollutants. It causes breathing difficulties such as asthma, cough and wheezing in children. Sulphur dioxide is produced by combustion of fuels like coal in power plants. It can cause respiratory problems, including permanent lung damage.

Group Discussion

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Creative Activities

Do it yourself.

HOTS Questions

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Periodic Assessment - I

Do it yourself

Half-Yearly Examination

Do it yourself

Periodic Assessment - II

Do it yourself

Final Examination

Do it yourself