Incorporates NEP

SB Signature

Young SCIENTIST

Teacher's Learning Materials

6–8

SCIENCE MAGIC–6

CHAPTER-1
FOOD AND ITS SOURCES

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (b) 4. (d)
5. (d) 6. (b) 7. (d) 8. (a)

B. Fill in the blanks :

1. body 2. sugar 3. Vegetables
4. honey 5. Snakes 6. Food

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

1. (T) 2. (T) 3. (T) 4. (T)
5. (T) 6. (F)

D. Match the two columns :

1. (iii) 2. (v) 3. (iv) 4. (i) 5. (ii)
6. (vii) 7. (vi)

E. Give examples of the following (two in each case) :

1. Cow, Rabbit
2. Lion, Tiger
3. Crow, Sparrow
4. Chicken, Duck
5. Milk, Butter

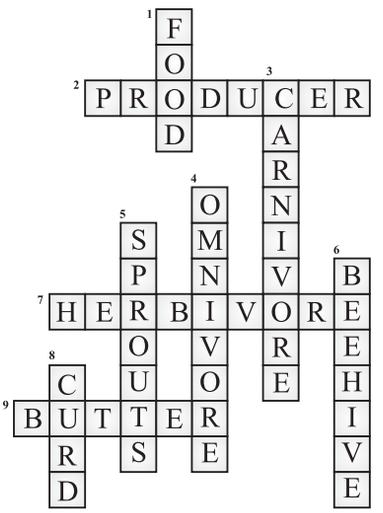
F. Solve the following crossword puzzle with the help of clues given alongside :

Across

2. Producer
7. Herbivore
9. Butter

Down

1. Food
3. Carnivore
4. Omnivore
5. Sprouts
6. Beehive
8. Curd



G. Answer the following questions :

1. We need food because it provides energy to our body and help our body in the growth and repair or replacement of worn out cells.
2. (i) Squirrels and rabbits have sharp front teeth to bite nuts and seeds in small pieces.
   (ii) Elephant have long trunk to lift their food and put it into their mouth.
3. The substances from which the food is made are called ingredients. For example : flour and water are ingredient of chapati. Idlis are made of rice and dal batter and salt, vegetable soup is made from vegetables, water, salt, oil and spices.
4. On the basis of their animals food habits animals are grouped as follows :
   (i) Herbivores : Plant-eating animals are called herbivores.
   Ex : Cow, buffalo.
   (ii) Carnivores : Flesh-eating animals are called carnivores.
   Ex : Lion, Tiger.
   (iii) Omnivores : Both plants and flesh eating animals are called omnivores.
   Ex : Crow, Bear
   (iv) Scavengers : They eat the remains of dead animals.
   Ex : Vultures, Jackals.
   (v) Decomposes : Fungi and bacteria feed on dead plants and animals and they break down their bodies into simpler substances.
   Ex : Fungi, Bacteria.
5. (a) Sharp front teeth of herbivores help them to bite, cutting and grind the food.
   (b) Long pointed canines of carnivores help them to tearing the flesh.
   (c) Eagles have curved and pointed beaks to tear the flesh.
   (d) Chameleons have a long and sticky tongue to catch their prey.

[HOTS]

- It we don't eat food for a long time we may not get enough of energy which is necessary for all our work.
- Fish is called a healthy source of food because it is full with important nutrients such as protein and vitamin D. Fish is also a great source of omega-3, fatty acids which are incredibly important for our body & brain.
- Part C is the best way to classify the three organism.

CHAPTER-2

COMPONENTS OF FOOD

A. Tick (✓) the correct option :

1. (a) 2. (b) 3. (c) 4. (a)
5. (d) 6. (c) 7. (b)

B. Fill in the blanks :

1. Food 2. rice, wheat, potato
3. B, C 4. Animal
5. Marasmus

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

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

D. Match the two columns :

1. (e) 2. (c) 3. (a) 4. (b)
5. (f) 6. (d)

E. Write one word for the following :

1. Starch 2. Starch
3. Proteins
4. Carbohydrates and Proteins

F. Answer the following questions :

1. Glucose and starch are the two types of carbohydrates.
2. A diet containing the right quantity of all the nutrients as per age, gender and type of work of an individual.

   A typical balanced diet should contain.

Carbohydrates	60%
Fats	15%
Proteins	25%
Minerals	60%
Vitamins	15%
Roughage	25%

   Sufficient water
3. Roughage is the dietary fibre present in the food. We eat roughage to add bulk to the food and this satisfies our appetite.
4. Water helps our body to absorb nutrients from food. It also helps in throwing out wastes from body as urine and sweat.
5. (a) **Carbohydrates :** Carbohydrates mainly provide energy to our body.

   (b) **Proteins :** Proteins are needed for the growth and the maintenance our body.

   (c) **Water :** Water helps our body to absorb nutrients from food.
6. Intake of more fat than carbohydrates in diet is not advisable because if more fat is present in our body then it will settle in the blood vessels and won't allow the blood to flow. When we eat too much fat we may end up suffering from a condition called obesity.
7. Marasmus is caused by the deficiency of proteins and carbohydrates.
8. The condition of nutrition in which the food is either in inadequate quantity or in excess, or it lacks in some essential nutrients is called malnutrition.

   Malnutrition affect very badly to the child growth. Due to malnutrition child falls sick quite often and many diseases are known to occur just because of imbalances in the diet.

[HOTS]

Children need more proteins and calcium because protein builds, maintains and repair our body tissue and it is important for the growth of children they need calcium for healthy bones and teeth.

CHAPTER-3

FIBRE TO FABRIC

A. Tick (✓) the correct option :

1. (d) 2. (c) 3. (d) 4. (b)
5. (a) 6. (c)

B. Fill in the blanks :

1. fibre 2. knitting 3. Silk
4. Stagnant water, excessive rain
5. Hemp

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

1. (T) 2. (T) 3. (T) 4. (F)
5. (F) 6. (T)

D. Match the two columns :

1. (c) 2. (d) 3. (a) 4. (e)
5. (b)

E. Answer the following questions :

1. We wear clothes to cover our body and to protect it from harsh weather as well as to look good.
2. The process of making yarn from fibres is called spinning. In this process, fibres from a mass of cotton wool are drawn out and twisted. This brings the fibres together to from a yarn.
3. Mat, Ropes.
4. Natural and artificial fibres are used for making yarn.
5. Fibres which are made from chemical substances that are not obtained from plant or animal sources are called synthetic fibres.
6. **Use of cotton :** (i) Cleaned and carded raw cotton is used in hospitals. (ii) Cleaned and carded cotton is used as fillers in pillows, quilts and mattresses.

   Use of Jute : (i) Jute fibre is used for making ropes. (ii) Jute yarn is extensively used in making the packaging cloth.
7. The fibres which are found on the skin of animals are called animal fibres.

   Ex : Silk, wool
8. A loom is a device used to weave cloth. The loom is to hold the wrap threads under tension to facilitate the interviewing of the weft threads.

[HOTS]

Wearing many layers of cotton clothes will keep us warm in winter was wearing a tick woollen sweater because many layers of cotton clothes trap a more amount of air in between them. As we known that air is a poor conductor of heat and it do not allow the body's heat to go outside and as a result it keeps us warm.

CHAPTER-4

SPORTING MATERIALS INTO GROUPS

A. Tick (✓) the correct option :

1. (b) 2. (b) 3. (c) 4. (c)
5. (c)

B. Fill in the blanks :

1. Matter 2. Wood, cotton, jute
3. water 4. Transparent
5. Sorting

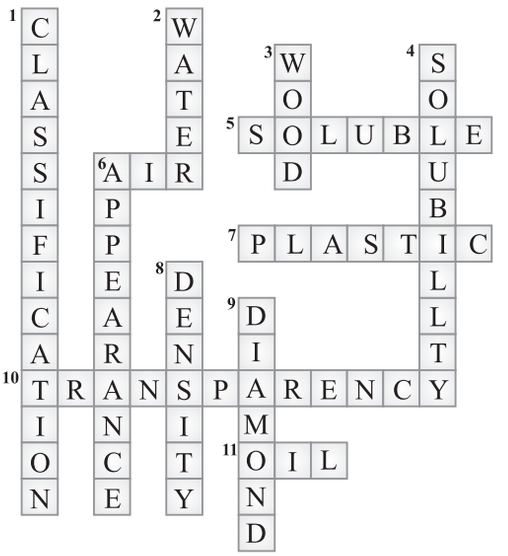
C. Write 'T' for True and 'F' for False statements:

1. (T) 2. (T) 3. (F) 4. (F)
5. (F) 6. (T)

D. Match the two columns :

1. (a) 2. (e) 3. (d) 4. (b)
5. (c)

E. Solve the following crossword puzzle with the help of the clues given below :



Across

5. Soluble 6. Air 7. Plastic
10. Transparency 11. Oil

Down

1. Classification
2. Water
3. Wood
4. Solubility
6. Apparency
8. Density
9. Diamond

F. Answer the following questions :

1. To find whether a material is lustroas or non-lustroas, we need to cut that substances into half or of any size if the cross sectional area is shiny then it is lustrous and if is not then non-lustrous.
2. **Miscible liquids :** Liquids that get completely mixed with water are called miscible liquids.

   Immiscible liquids : Liquids that do not mix with water and form a separate layer. They are called immiscible liquids.
3. There is a large variety of things around us. To better understand the world we live in, we organize this diversity of things by classifying them into groups based on some common characteristics or properties. Classification help us to understand the qualities of objects in a better way.
4. Certain materials or properties part of the light to pass through them. Such materials are called translucent.

   Ex : Oily paper, waxed paper
5. Important properties of materials are :
   - **(i) Appearance/Lustre :** The property of a material with a shining surface is called lustre. Ex : Gold and silver
   - **(ii) Solubility :** Substances that dissolve. when mixed with water are said to be soluble in water. Whereas those substances that do not dissolve in or mix with water are insoluble in water.
   - **(iii) Hardness :** Those substance which can be easily compressed are soft but those which cannot be compressed are hard.
   - **(iv) Transparency :** The materials which allow light to pass through them are called transparent. Ex : Glass, water.

     The materials which do not allow light to pass through them are called opaque.

     Ex : Wood, stone is certain materials allow only a part of the light to pass through them such material are called translucent.
   - **(vi) Floating and Sinking :** Substances insoluble in water can float or sink in it.
   - **(vii) Conduction of Heat :** It is the ability of a material to allow heat or electricity while some are not.

[HOTS]

It is a homogenous mixture. Whenever we go to fix a new bulb in our lamp it is advisable to wear plastic flippers because there could be stray currents in the circuit that may lead to a shock. Plastic flippers are insulators and they will not allow conduction.

CHAPTER-5
SEPARATION OF SUBSTANCES

A. Tick (✓) the correct option :

1. (c) 2. (b) 3. (c) 4. (a)
5. (b) 6. (a)

B. Fill in the blanks :

1. Elements, compounds 2. Mixture
3. sedimentation
4. magnetic substance, non-magnetic substances
5. Salt 6. Water

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

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

D. Write one word for each statement :

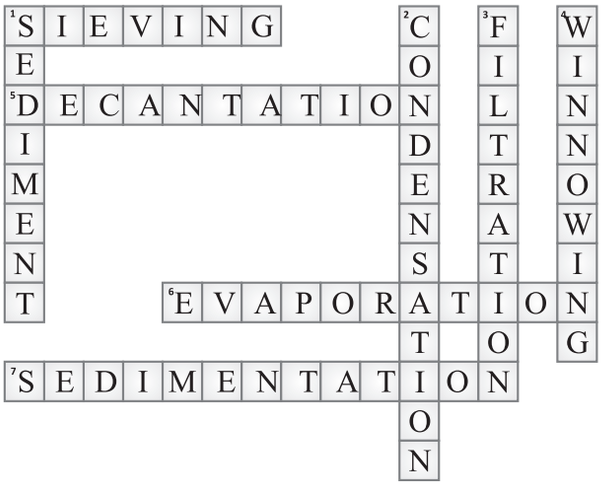
1. Hand picking
2. Evaporation, condensation
3. Handpicking 4. Sedimentation

E. Define the following terms :

1. **Loading :** It is the process of increasing the rate of sedimentation. In this method, the suspended particles in the solution are made heavier.

2. **Crystallization :** It is the method of separation in which we get crystals of a pure substance by cooling its not saturated solution.
3. **Evaporation :** It is the process in which a liquid changes into a gas.
4. **Filtration :** It is a method to separate an insoluble solid from a liquid by passing the mixture through a filtering device.
5. **Decantation :** It is the method by which liquid is poured out without disturbing the sediment.

F. Solve the crossword puzzle with the help of the clues given below :



Across

1. Sieving
5. Decantation
6. Evaporation
7. Sedimentation

Down

1. Sediment
2. Condensation
3. Filtration
4. Winnowing

G. Answer the following questions :

1. Milk, A cup of tea, A sugar syrup and Soda water.
2. Pouring down a mixture of heavier and lighter particles from a height to separate them by wind or blowing air.
3. Loading is used to separate suspended impurities because it is a process in which chemical substances like alum is added to liquid to help the suspended particles of liquid to form a sediment of solid.
4. Different method fro purification of water :
   (i) **Simple water filter :** For purification of drinking water, simple water filters are used in homes.
   (ii) **Metallic filters :** To purify sewage water, metallic filters are used in big cities.
   (iii) **Electric water filter :** Now a days, electric water filters are much in use for purification of water.
   (iv) **Water work :** In big cities, water is supplied by water works.
   (v) **Distillation :** In this method, the components of a mixture are separated by using both evaporation and condensation.
   (vi) **Evaporation :** It is a process in which liquid evaporated.
   (vii) **Sublimation :** This method is used to separate those solid substances which sublime on heating from a mixture.
   (viii) **Crystallization :** In this method. We get crystals of a pure substances.
   (ix) **Centrifugation :** The procedure of separating the suspended particles of a substance in a liquid by revolving the liquid with high speed.
5. Sedimentation and Decantation :
   The settling down of heavy particles, insoluble in water is called sedimentation and to separate the upper clean layer of liquid from a mixture of heavy insoluble particles by tilting the vessel slowly into another is called decantation.
   Example : A mixture of equal quantities of petrol and water cannot be separated completely using a separating funnel.
6. In this process sea water is collected in small fields. Water is evaporated by the heat of teh sun and salt is left over in the fields. Evaporation method is used to obtain the solid dissolve in the liquids.
7. Sieving allows the fine flour particles to pass through the holes of the sieve while the bigger impurities remain on the sieve.

It is used in flour mill, impurities like husk and stones are removed from wheat before grinding it similarly, you must have seen large sieves being used to separate pebbles from sand at the site of building construction.

[HOTS]

- This can be done by the process of sieving. It the mixture of sugar and wheat flour is allowed to pass through a sieve, then the fine wheat flour particles would pass through the seive, the sugar particles whould be retained by the seive.
- River water is clear whereas sea water is not clear through both have mud and sand because sea water contains dissolved salt in it and in river water the mud and sand particles set at the bottom of water.

CHAPTER-6
CHANGES AROUND US

A. Tick (✓) the correct option :

1. (c) 2. (a) 3. (d) 4. (b)
5. (d) 6. (d) 7. (b)

B. Fill in the blanks :

1. chemical change 2. ice
3. Rusting 4. permanent
5. Carbon dioxide 6. chemical
7. temperate 8. Used

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

1. (T) 2. (F) 3. (T)
4. (T) 5. (T) 6. (T)
7. (T) 8. (F)

D. Differentiate between the following :

1.

Natural Changes	**Man Made Changes**
Some change in nature take place by themselves. These are natural changes. Ex : Change in season.	Man makes some change happen accoring to his requirements and benefits. There are called man made changes. Ex : Making curd from milk.

2.

Reversible Changes	**Irreversible change**
Change in which the object or material can be obtained back in their original form. Ex. Making a toy aeroplane by folding paper.	Change from which we cannot get object or material back in their original form. Ex. Cooking food

3.

Physical Changes	**Chemical Change**
Changes in which no new substances are formed are called physical changes. Ex : Dissolving salt in water.	Changes which results in formation of new substances with different properties are chemical changes. Ex : Burring of wood

4.

Periodic Changes	**Non-periodic Change**
The changes which are occur after a certain time interval are called periodic changes. Ex : Revolution of the earth.	Changes which do not happen after a certain time interval are called non periodic change. Ex : Tremors of earthquake

E. Classify the following changes into their respective kind :

1. Chemical change 2. Physical change
3. Non-periodic change 4. Chemical change
5. Natural change 6. Physical change

F. Match the following :

1. (b) 2. (a) 3. (c) 4. (d)
5. (e)

G. Answer the following questions :

1. Yes, we can reverse this process.
2. The process of becoming or making something different changes are classified as fast and slow changes, reversible and irreversible changes, desirable and undesirable changes.
3. Burning of paper is a chemical change because when we burn paper, we get a new substance in the form of ash. It is a permanent change and we cannot reverse it. We cannot get back the paper.

4. Curding of milk is a slow change while burning of a match stick is a fast change.
5. Change occur everywhere, every moment around us. Everything in the wold is subject to change.

   Example : Weather change from day to day.

   Day changes into night.
6. Heat is absorbed during the change of ice into water. This heat is absorbed by ice from the container. Thus, heat energy is absorbed during some changes.
7. In our daily, life, we see that heat change ice into water, but the same water at low temperature, again changes into ice. In the same way, on boiling water change into water vapour and the vapour, on cooling, again changes into water.

[HOTS]

It is a chemical change because a new substance in formed after cooking and this process cannot be reversed.

CHAPTER-7
THE PLANTS WORLD

A. Tick (✓) the correct option :

1. (a) 2. (c) 3. (b) 4. (b)
5. (c) 6. (a) 7. (c) 8. (c)

B. Fill in the blanks :

1. Plants
2. Phanerogamae
3. Pistil
4. trees
5. ovules
6. photosynthesis
7. Anther
8. chlorophyll

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

1. (T) 2. (T) 3. (F) 4. (T)
5. (F) 6. (F)

D. Match the following :

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

E. Answer the following questions :

1. In plants stem forms a link joining roots, leaves and flowers. It has nodes and interlopes and this in the strangest part of the plants. It forms the shoot system in plants.
2. Plants having flowers, fruits and seeds are called flowering plants. There are also called phanerogamae or seed bearing plants as they carry seeds in their flowers.
3. The plants that do not have flowers, fruits and seed are called non flowering plants. These plants have been divided into three classes.

   (i) Thallophyta (ii) Bryophyta

   (iii) Pterdophyta
4. **Taproot :** It consists of a single main primary root with them lateral branches arising from it.

   Ex. : Mango, neem, pea, cotton plant and sunflower.

   Fibrous root : In this root system, there is no primary root. All fibrous roots start from a common point in the base of the stem.

   Ex. : Grass, corn, wheat, sugarcane
5. **Herbs :** Plants with green and tender stems are called herbs.

   Ex. Tomato, rice.

   Shrubs : Shrubs are medium sized plants with hard and woody stem.

   Ex : Rose, lemon

   Tree : Plants having wooden, hard and very long stems are called trees.

   Ex : Coconut, mango.
6. **Xerophytes :** Plants growing in deserts and dry regions are called zero phytes.

   Mesophytes : Plants which grow in plains and do not require much water for their survival are called mesophytes.
7. Plants produced food and oxygen in the process of photosynthesis. So photosynthesis is essential process because in this O_2 is produced from living being.
8. **Function of Roots :**

   (i) Roots absorb water and minerals salts from the soil and transport it to leaves and other parts of the plant through the stem.

(ii) Roots fix the plans firmly in the soil. They are known as anchor of plant in the soil.

[HOTS]

- Sapling of a tree cannot be consider as a herb because herbs are usually small plants and upon obtaining growth they contain some or the other medical benefit.
- Some trees have roots handing down in the air or running into the mass growing on the trees. Such aerial roots, are used to receive water and nutrient intake directly from the air.

CHAPTER-8
MOVEMENTS IN THE BODY

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (b) 4. (c)
5. (a) 6. (d) 7. (b) 8. (c)
9. (b) 10. (b)

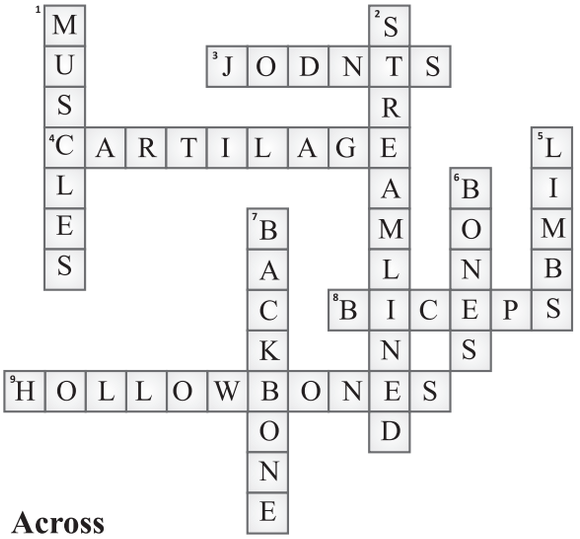
B. Fill in the blanks :

1. Animals
2. movement
3. Ball and socket
4. Invertebrates
5. Verterbral column

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

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

D. Solve the following crossword puzzle with the help of clues given :



Across

3. Joints
4. Cartilage
8. Biceps
9. Hollow bones

Down

1. Muscles
2. Streamlined
5. Limbs
6. Bones
7. Backbone

E. Answer the following questions :

1. Skeleton gives shape to different plant of body.
2. A joint is a point where bones meet. The different joint found in our body are :
   (i) Immovable Joint (ii) Pivot Joint
   (iii) Ball and Socket Joint
   (iv) Hinge Join
3. A long rigid structure which is starts from our neck downwards at our back is called vertebral column.
   The vertebral column extends from the base of the skull to the hip.
   It consists of 33 small ring like vertebrae joined end to end.
   The main function of the vertebral column in protection of the spinal card.
4. Movement is the temporary or permanent displacement of a body or one of its parts from its original position while locomotion is the displacement of the entrie body from one place to another.
5. **Pivot Join :** The joint joining the neck the head is called pivot. This joint makes it possible to move the head to and for or left to right. This movement is different from the movements of our hand in which we can move our hand in a complete circle.

[HOTS]

Teeth consists mostly of hard, in organic minerals like calcium. They also contain nerves, blood vessels and specialized cells. But they are not bones. Teeth dont' have the regenerative powers that bones do and can't grow back together if broken.

CHAPTER-9
ORGANISMS AND THEIR SURROUNDINGS

A. Tick (✓) the correct option :

1. (d) 2. (b) 3. (a)

B. Fill in the blanks :

1. Habitats
2. land
3. touch-me-not
4. streamlined
5. reproduce

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

1. (T) 2. (T) 3. (T) 4. (T)
5. (T)

D. Answer the following questions :

1. Availability of air, water and temperature are the conditions that support life on the earth.
2. Each organism is born, grows into adult and old and then dies. This whole process is known as the life cycle of the organism.
3. The common characteristics of the living and non-living things are as follow :
   (i) All things, whether living or non-living posses mass, shape and occup space.
   (ii) They are made up of basic structural units. In case of living things, cell is the structural units. In a non-living thing (like a chalk), the molecule is the structural unit.
4. Animals which live in very hot places like deserts have some adaptations. These animals live in burrows deep in the sand and come out during night, when it is cooler.
5. Life cycle : Each organism is born, grows into adult and old and then dies. This process is known as the life cycle of the organism.

   Life span : All living things have different life time. It can be minutes, months or years. This is called life span.

[HOTS]

A greater variety of plant and animals in the forest helps it to regenerate and grow. Greater variety of plant means more food and habitat for the herbivores. An increase in herbivores means more food for carnivores. Decomposers help to maintain the supply of nutrients to the soil and to the growing plants.

CHAPTER-10
MEASUREMENT AND MOVING THINGS

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (b) 4. (b)
5. (a) 6. (b) 7. (d)

B. Fill in the blanks :

1. punctuation
2. second
3. litre
4. Mass
5. Kilometre

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

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

D. Define the following :

1. **Standard unit :** The known quantity of a thing with which the unknown quantity of other thing is compared is called the standard unit.
2. **Uniform motion :** The motion of an object in which the object travels in a straight line and its velocity remains constant along that line is called uniform motion.
3. **Rotatary motion :** When an object moves about an axis and different parts of it move by different distances in a given interval of time it is called rotatory motion.
4. **Volume :** The place occupied by an object is called its volume.
5. **Temperature :** The measurement of heat in an object is called its temperature.
6. **Periodic Motion :** If a motion repeats itself after equal intervals of time, it is called periodic motion.

E. Answer the following questions :

1. The known quantity of a thing with which the unknown quantity of other thing is compared is called the unit.
2. Body parts should not be used for measurement because the length of body parts varies from person to person. Hence there was no uniformity in measurement.

3. When an object which remains at the same place and at the same position it is said to be at rest.
4. **Similarity :** Both the wheel of a bicycle and ceiling fan execute a circular motion on a fixed axis.

   Difference : A bicycle executes a rectilinear motion while a ceiling fan does not execute rectilinear motion.
5. **Rectilinear motion :** When a body travel in a straight line is called rectilinear motion.

   Curvilinear motion : When a body travel in curved path is called curvilinear motion.

[HOTS]

- Yes, we are in the motion because as the plane is in motion, the body is also in motion.
- We will measure the circum terence of the fitness ball. Fitness ball sizes are listed in diameter (the distance straight from one side of the sphere to the opposite side, passing through the center), not circumference. They, we will divided the circumference by π, or $\frac{22}{7}$ to get the diameter.

CHAPTER-11
LIGHT, SHADOWS AND REFLECTIONS

A. Tick (✓) the correct option :

1. (b) 2. (b) 3. (d) 4. (c)
5. (a) 6. (c)

B. Fill in the blanks :

1. sun 2. exact and virtual
3. straight 4. long
5. liquid

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

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

D. Match the following :

1. (d) 2. (c) 3. (b) 4. (e)
5. (a)

E. Write one word the following :

1. Transparent material 2. Lumnious object
3. Light 4. Shadow

F. Answer the following questions :

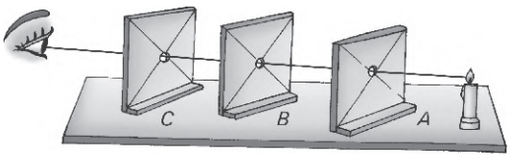
1. **Object :** Luminous objects are those which given out light of their own. For example : sun, bulb.
2. Region of darkness behind the object where no light is able to reach in known as the shadow of object.

   Formation of Shadow : A shadow is formed when a beam of light is blocked by an opaque object.
3. A mirror is typically made of glass with a shiny metal. When a mirror reflects light, it forms an image. An image is a copy of an object formed by reflection. A real image is a true image which forms in front of a mirror when reflected light rays actually meet.
4. Activity to show that light travel in a straight line.

   Take three cardboard of the same size. Label them A, B and C. Make a small hole in the centre of each cardboard. Arrange all the three card boards so that the three holes are in a straight line. Place a lighted candle near the hole of cardboard. A as shown in the figure given below. Now observe the flame of the candle through holes in the cardboard from the apposite side. No shift one of the cardboard say cardboard B slight and observe the flame of the candle again.

   Can you now see the flame of the candle through the hole as you did before? No you cannot.

   Hence, we can say the light travels in a straight line.



5. The different between image and shadow is that the image is actually a virtual reflection which can be created from different lenses and mirrors while shadow is a patch of darkness on a surface which is created by the blocking of the light rays by an solid opaque object.

[HOTS]

- The actual time is quarter to eight.
- Yes, light is a form of energy.

CHAPTER-12
ELECTRICITY AND CIRCUITS

A. Tick (✓) the correct option :

1. (a) 2. (d) 3. (d) 4. (c)
5. (c) 6. (d) 7. (d) 8. (a)

B. Fill in the blanks :

1. Electricity 2. Switch
3. electricity 4. electric
5. two

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

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

D. Match the following :

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

E. Define the following terms :

1. **Electric circuit :** The complete path of the flow of electric current form one terminal of the cell to its other terminal through all the components is known as an electric circuit.
2. **Conductor :** Materials that allow electric current to flow through them are called conductors.
3. **Dry cell :** An electric cell in which the electrolyte is absorbed in a solid to form a paste, preventing spillage.
4. **Electric current :** Moving charged particles in a circuit is caused an electric current.
5. **Battery :** The combination of cells is known as battery.
6. **Insulator :** Materials which do not allow the flow of current through them are called insulators.

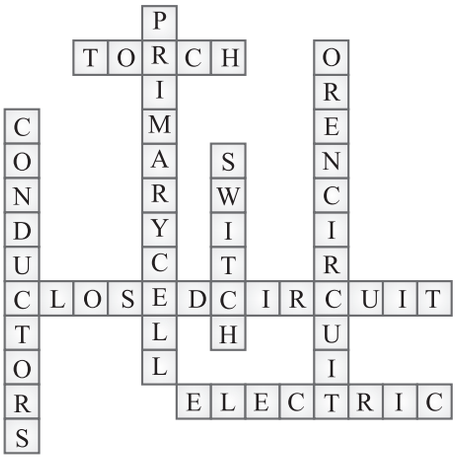
F. Complete the crossword with the help of the clues provided :

Across

2. Torch 6. Closed circuit
7. Electric

Down

1. Primary cell 2. Open circuit
4. Conductors 5. Switch



G. Answer the following questions :

1. The complete path of the flow of electric current from one terminal of the cell of its other terminal through all the components is known as electric circuit.

   In the circuit the flow of current is from the positive terminal to negative terminal of the electric cell.
2. The purpose of insulating covering of the metal part of an electric wire is to prevent accidental centad with other conductors of electricity, which might result in an electric current.
3. **Closed circuit :** An electric circuit through which current can flow in and unin interrupted path closed circuit is meant to be a circuit activated by a switch that close a circuit loop and allows current to flow. Open circuit is a condition when an electrical terminal is not connected to any impedance.
4. A switch allows us to make or break a circuit according to our convenience.
5. **Conductors :** Material that allow electric current to flow through them are called conductors. *Ex.* Copper, silver

   Insulators : Materials which do not allow the flow of current through them are called insulators. *Ex.* Rubber, plastic

6. **Cell :** Electric cell is a small source of electricity. The cell contains. chemical and chemicals undergo a reaction which in turn produce electricity.

   Battery : When all the cells are placed one after the other in such as way that the positive terminal is always touching to the negative terminal of the other one. This combination of cells is known as battery.

[HOTS]

- The cells passes an electric current through the torch bulb which heats up its filament and makes the bulb glow.
- Electricity does not flow through an open circuit because there is a gap in its path. A bulb will not light up if there is a gap in the circuit. A bulb will not light up if the circuit is a open.

CHAPTER-13
FUN WITH MAGNETS

A. Tick (✓) the correct option :

1. (c) 2. (b) 3. (d) 4. (a)
5. (d) 6. (d) 7. (d) 8. (b)

B. Fill in the blanks :

1. Magnet 2. Earth 3. heating
4. Pairs 5. Compass

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

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

D. Match the following :

1. (d) 2. (e) 3. (b) 4. (a)
5. (c)

E. Define the following :

1. **Repulsion :** The force by which objects push each other away.
2. **Lodestone :** It is a naturally magnetized mineral.
3. **Magnetite :** It is the only are of iron which is or natural magnet.
4. **Magnetic poles :** The parts of the magnet where more magnetic materials stick are called magnetic poles.
5. **Magnetic substance :** The materials which get attracted towards a magnet are magnetic material.
6. **Magnetic compass :** The instrument that uses a magnet to find directions.

F. Answer the following questions :

1. A magnet is a piece of iron, nickel or cobalt that can attract iron containing object.
2. **Magnetic materials :** The materials which get attracted towards a magnet are magnetic.

   Ex : Iron, nickel or cobalt.

   Non-magnetic material : The materials which are not attracted by a magnet are non-called magnetic, materials.

   Ex : Plastic, Rubber.
3. A freely suspended magnet always point in North direction because the earth itself behaves like a magnet. The south pole of a magnet bar points towards geographics north because the magnetic field around the earth happens to have its north pole towards north.
4. It is increased by increasing the number of loops of wire around the iron core and by increasing the current or voltage.
5. Different properties of a magnet can be following divided into two groups.
   (i) Attractive property of magnet : This property is used to determine the substances as magnetic or non-magnetic.
   (ii) Directive property of Magnets : This property of magnet is used to find directions on the surface of the earth.

   Magnet lose magnetism as they heat but again magnetism which cooled provided the maximum temperature is below their curie temperature.
6. **Uses of Magnets :**
   (i) Magnets are used in daily life usage like toys and stickers.
   (ii) They are used as magnetic compass.

(iii) They are used in separating magnetic material from dumping grounds.

(iv) They are used in lifting the big scrap of iron like dump cars.

(v) Surgeons use magnets to extract iron pieces from wounds.

[HOTS]

A compass needle points North South because the north pole of the magnet inside it is attracted to the south pole of Earth's built in magnet. In other words, the they we call Earth's magnetic north pole is actually the south pole of the magnet inside earth.

CHAPTER-14
PRECIOUS WATER

A. Tick (✓) the correct option :

1. (a) 2. (d) 3. (a) 4. (c)
5. (c) 6. (b)

B. Fill in the blanks :

1. Rain 2. transpiration
3. Drought 4. condensation
5. Oceans 6. Floods 7. ice

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

1. (T) 2. (F) 3. (T) 4. (T)
5. (F) 6. (T)

D. Match the following :

1. (e) 2. (a) 3. (b) 4. (c)
5. (d)

E. Give one word of the following :

1. Potable water 2. Renewable resources
3. Condensation 4. Flood
5. Water table

F. Answer the following questions :

1. Uses of water :
   (i) Aquatic animals use oxygen dissolved in water for respiration.
   (ii) Water acts as a medium in transportation of food, mineral and other essential substances in plants.
   (iii) We can easily assimilate our food if it is mixed in water.
   (iv) Carbon dioxide and oxygen gases are dissolved in water.
2. Water is called a life giving liquid because without water there would be no life on earth. Just like the other living organisme, we also need to consume water to survive. We need water for many other activities such as cleaning, washing, cooking and irrigation.
3. Clouds are formed when moist, warm rising air cools and expands in the atmosphere. The water vapour in the air condenses to form tiny water droplets which are the basis of clouds.
4. One of the ways to increase the availability of water is to collect rainwater and to store it, to be used later. This process of collecting rain water is called rain water harvesting.
5. ◇ We can conserve water by different ways.
   ◇ Turn off the water tap while brushing your teeth.
   ◇ Install water saving shower heads on flow restrictions.
   ◇ Use a watering can to water the plants.
   ◇ Use a bucket to clean the floors.
   ◇ Don't play too much with water in the summer.

[HOTS]

◇ Deforestation results in the water not being able to be released back into the atmosphere, affecting the balance of the water cycle.

◇ Sea water is toxic to humans because our body is unable to get rid of the salt that comes from sea water. Our body normally get rid of excess salt by having the kidneys produce urine, but it needs fresh water to dilute the salts in our body.

CHAPTER-15
IMPORTANCE OF AIR

A. Tick (✓) the correct option :

1. (a) 2. (c) 3. (c) 4. (b)

B. Fill in the blanks :

1. Air 2. combustion
3. ozone 4. exosphere

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

1. (T) 2. (F) 3. (F) 4. (F)

D. Match the following :

1. (c) 2. (d) 3. (e) 4. (a)
5. (b)

E. Answer the following questions :

1. Air is considered as a mixture because it is a mixture of different gases. The composition of air is 78% nitrogen, 21% oxygen and 1% other inner gases like Hydrogen, argon, helium, neon.
2. Wind energy is the use of wind to provide mechanical power through wind. It two advantages arc :
   - It is unlimited, free, renewable resource.
   - Wind energy is far more eco-firendly than the burning of fossil fuels for producing electricity.
3. By photosynthesis process green plants prepare their food. In this process plants return oxygen to the atmosphere. Plants also use oxygen during respiration, they release more oxygen as compared to the oxygen used by them. It maintains the balance of oxygen in the atmosphere.
4. Importance of air :
   - **(i) Maintenance of water cycle :** Atmosphere continuously provides water for all living things with the help of water cycle. It controls the temperature around us.
   - (ii) The Upper layer of the atmosphere absorb some of the heat and light falling on it and some of it is reflected back.
   - (iii) The ozone layer present in the atmosphere absorb the harmful ultra violet rays present in the sunlight and presents them from reaching the earth.
   - (iv) Source of oxygen and nitrogen : Atmosphere is the source of oxygen for all living beings.
   - (v) Formation of wind, storms and cyclones.

[HOTS]

It we keep a fish in a closed container without any aquatic plants, it is more likely, to be dead. The reason is that the aquatic plant absorbs CO_2 and gives out oxygen. These oxygen is inhaled by the fishes for their survival. So, if there were no aquatic plants, then the fish would not get oxygen for respiration.

CHAPTER-16
WASTE AND ITS MANAGEMENT

A. Tick (✓) the correct option :

1. (b) 2. (c) 3. (c) 4. (a)
5. (c)

B. Fill in the blanks :

1. drains, toilets 2. Organic
3. packaging 4. animal dung
5. garbage

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

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

D. Define the following terms :

1. **Leachate :** Leaching is the seepage of dissolved substance from the decomposing garbage in the soil. The dissolved substances are called leachate.
2. **Composting :** The conversion of solid waste into manure is called compositing.
3. **Landfills :** A landfill is a natural slope or a man made through that is filled up with waste.
4. **Waste :** All the materials that are no longer needed and are discarded are called waste.
5. **Incineration :** Burning of waste material like leaves in called Incineration.

E. Answer the following questions :

1. All the materials that are no longer needed and are discarded are called waste.
2. Solid wastes destroy the natural beauty of a place. Garbage dump becomes a breeding place for flies and mosquitoes over flowing sewage many contaminate drinking water. Garbage heap is a source of infection from many diseases. That is how waste is harmful for us health.

3. The composting process requires organic wastes such as leaves, grass, fruit and vegetable scraps, soil water and oxygen. The micro-organism eat the organic waste breaking down into its simplest components.
4. The basic difference between biodegradable and non biodegradable is that biodegradable items decompose or break down naturally where as non-biodegradable items don't break down naturally.
5. Recycling means processing of a specific kind of waste so that it can be made into new things and reused.

   Recycling helps to reduce energy usage, reduce the consumption of fresh raw materials-reduce air pollution and water pollution by reducing the need for conventional waste disposel.
6. Steps should be taken to ensure that a land fill not cause pollution are.
   - Underground water level should be low.
   - Flood water cannot reach there

   These measure will help prevent pollution.
7. Differentiate between :
   - **Recyclable waste** : The waste mateiral that can be recycled again and again is called recyclable material.

     Ex : newspaper, paperboard, plastic.
   - **Now-recyclable waste :** The waste material that cannot be recycle again and again is called non-recyclable material.

     Ex. Cutlery, chewing, gum wet paper.
   - **Composting :** Compost is the manure which is prepared from the wastes of farm including vegetable wastes, animal refuses, straw domestic wastes that are keep area in pits.

     Vermi composting : Vermi compost is the manure by using earthworms

[HOTS]

In the compost pit substances like polythene bags, aluminium foil and broken glass bottles which are non biodegradable will not be converted into compost by the red worms. Leaves, vegetable keels and left over food are converted into compost.

❑❑❑

CHAPTER-1
NUTRITION IN PLANTS

A. Tick (✓) the correct option :

1. (d) 2. (b) 3. (c) 4. (d)
5. (a) 6. (d) 7. (b)

B. Fill in the blanks :

1. Humans, animals 2. autotrophic
3. saprophytic 4. Oxygen
5. Cuscuta, Orobranche, Viscum

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

1. (T) 2. (T) 3. (T) 4. (T)
5. (T) 6. (F)

D. Match the two columns :

1. (b) 2. (e) 3. (d) 4. (c)
5. (a)

E. Name the following :

1. HETEROTROPHS
2. CHLOROPHYLL
3. PHLOEM
4. HAUVSTORIA
5. SYMBIOSIS

F. Answer the following questions :

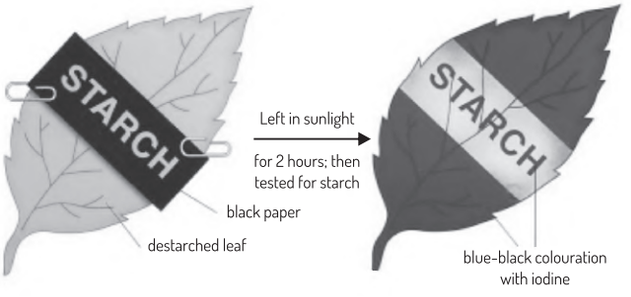
1. The entire process of taking in food by living organisms and it utilization within the body is called nutrition.
2. ◇ Chlorophyll sunlight, carbon di-oxide and water are necessary conditions to carry out the process of photosynthesis.
   ◇ Chlorophyll is present in green leaves. Sunlight and carbon dioxide are received from environment by the leaves. Water and minerals are transported to the leaves by the vessels which run like pipes throughout the root, the stem, the branches and the leaves.
3. **Parasite :** A parasite is an organism that live in or on another organism and derives nutrients from it.

   Ex : Cuscuta, orobanche and viscum

   Insectivore : Plants that derive some or most of its nutrients by trapping and consuming animals, mainly insect are called Insectivore ours plants.

   Ex : Pitcher plant, sundew, bladder wort and venus flytrap.
4. When two organisms live together and share shelter and nutrients; their association is called symbiotic relationship. They naturally help each other.
5. **Insectivorous plants :** Insectivorous plant are those carnivorous plants are plants that derive some or most of their nutrients by trapping and consuming animals, mainly insects.

   The common examples of insectivorous plants are pitcher plants sundew, bladderwort and venus flytrap.
6. To show the presence of starch in leaves, you can do the following activity. Take a variegated croton leaf which contains green coloured patches. Boil it in alcohol in a water bath to dissolve out green pigment and decolourise the leaf. Remove the leaf from boiling alcohol and dip it in hot water. Spread the decolourised leaf flat on a white title and drop iodine solution on it. The part containg starch will turn blue black but the parts without starch will stain brown or yellow with iodine.



7. **Autotrophic Nutrition :** It is the mode of nutrition in which the organism makes it food itself from simple inorganic substances.

   Ex. : Green Plants

Heterotrophic nutrition : Organisms which cannot manufacture food and have to depend upon other plant and animals to obtain energy. This is called heterotrophic nutrition.

Ex. : Animals and Human being.

8. **Define the following terns :**

(a) **Photosynthesis** : The process of converting water and carbon dioxide into carbohydrates, starch and oxygen in the presence of sunlight is called Photosynthesis.

(b) **Parasite** : An organism that lives in or on another organism and derives nutrients from it is called parasite.

(c) **Nutrition** : The entire process of taking in food by living organisms and it utilization within the body is called nutrition.

(d) **Autotrophic nutrition** : It is mode of nutrition in which the organism makes it food itself from simple in organic substances.

(e) **Heterotrophic nutrition** : The mode of nutrition in which organisms do not prepare their own food but are directly or indirectly dependent on plants for food is called heterotrophic nutrition.

(f) **Symbiosis :** When two organisms live together and share shelter and nutrients their association is called symbiosis.

9. Lichens do not have roots that absorb water and nutrients as plants do, but like plant, they produce their own nutrition by photosynthesis when they grow on plants, they do not live as parasites, but instead use the plants as a substrate so that is why lichens are unique in our earth.

10. **Parasitic plant :** Parasitic plants are those plants which live in or an another growing plant (host) and shelter from them.

Ex : Cuscuta, orobanche and viscum

[HOTS]

No, we are not autotrophs. Because autotrophs produce their own food using components like sun, chlorophyll but we cook food with raw materials obtained from plants and other sources.

CHAPTER-2
NUTRITION IN ANIMALS

A. Tick (✓) the correct option :

1. (b) 2. (a) 3. (c) 4. (a)
5. (c)

B. Fill in the blanks :

1. Animals
2. salivary glands
3. cud
4. digestion, simpler
5. Incisors
6. large intertine
7. 12
8. villi

C. Match the following :

1. (b) 2. (d) 3. (e) 4. (a)
5. (c)

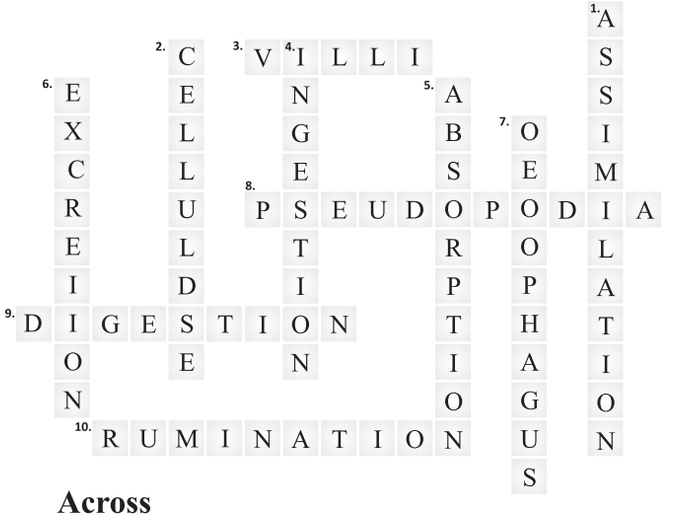
D. Write 'T' for True and 'F' for False :

1. (T) 2. (F) 3. (F) 4. (T)
5. (F) 6. (T) 7. (T)

E. Write one word for the following :

1. Alimentary canal
2. Tongue
3. Caecum
4. Enamel
5. Ingestion

F. Solve the crossword puzzle given alongside with the help of the clues given below :



Across

3. villi
8. Pseudopodia
9. Digestion
10. Rumination

Down

1. Assimilation
2. Cellulose
4. Ingestion
5. Absorption
6. Excretion
7. Oesophagus

G. Answer the following questions :

1. The key difference between absorption and assimilation is that absorption is the process of taking digested simple molecules into blood steam lymph via the intestinal villi and microville while assimilation is the process of synthesizing new compounds from the absorbed molecules.
2. **Absorption :** Taking in of soluble nutrients by the body cells.

   Assimilation : Utilization of the digested food by the body cell to get energy.

   Egestion : Getting rid of undigested food material is called egestion.
3. **Structure of Teeth :**

   Teeth are fixed into the gums. Each tooth has the following parts.

   Root : The part of a tooth embedded into the jaw and is tightly fixed by 'cement'.

   Crown : The top part of the tooth outside the gums.

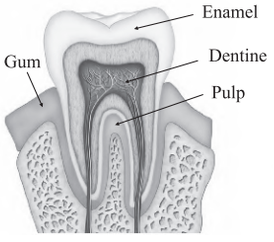
   Neck : The part between the root and the crown.

   The internal structure of the tooth is the following :

   Enamel : It is the white part of a tooth and is the hardest substance in our body. It is deposited outside the crown of the tooth. Enamel contains calcium salts.

   Dentine : Dentine is like a bone structure. It is hard.

   Cementum : It tightly fixes the tooth in the socket of the jaw.



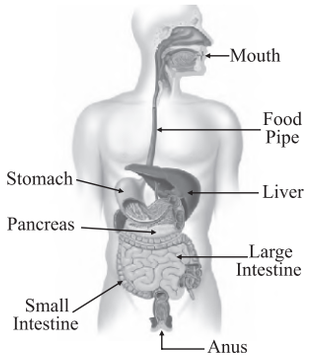
   Pulp Cavity : Inside the dentine, there is a soft pulp cavity which contains blood vessels and nerves.

   These are following four types of tooth.

   (i) **Incisors :** They are front teeth used for biting. They have cutting margins.

   (ii) **Canines :** They are pointed teeth which are used is tearing.

   (iii) **Premolars :** They are used for chewing and grinding.

   (iv) **Molars :** They are also used for chewing and girding the food have chewing and grinding the food have broad and flat surface.
4. Ingestion in Amoeba is with the help of pseudopodia. The food becomes trapped in a food vacuole. Inside the vacuole, food gets digested by digestive enzymes which are secreted into the food vacuole. Gradually, the digested food is absorbed and utilized by the cell.
5. In grass-eating animals, cellulose is digested in a special sac present at the junction of small and large intestine. It is called caecum. Cellulose digesting bacteria are present in caecum.
6. The nutrients present in the digested food are absorbed by the finger like projections on the inner wall of the small intertine. These villi increase the surface area for absorption Villi contain blood vessels. The digested food passes through the thin digested food passes through the thin walls of these blood vessels and enters the blood stream.
7. 

8. **Human digestive system :** In human the process of digestion invalves many steps an is carried out by a specific system. This system is called the digestive system.

The organs which constitute the human digestive system are :

Alimentary canal

- Buccal cavity
- Food pie or oesophagus
- Stomach
- Small intestine
- Large intestine
- Rectum
- Anus

Digestive glands

- Salivary glands
- Liver Pancreas
- Gall bladder

The digestive system from oesophagus to the anus is called alimentary canal.

9. **Define the following terms :**

(a) **Engestion :** Getting rid of undigested food material is called egestion.

(b) **Alimentary canal :** The digestive system from oesophagus to the anus is called alimentary canal.

(c) **Digestive glands :** Digestive glands are those glands which secrets digestive juice.

(d) **Ruminants :** Cud-chewing animals are called ruminants.

(e) **Ingestion :** Taking in food from external environment is called Ingestion.

(f) **Pseudopodia** : Pseudopodia is a structure which are found in amoeba who help in the digestion of food in amoeba.

[HOTS]

- In summary HCl in the stomach lumen accomplishes four things. It helps break down ingested tissues for attack by digestive enzymes; It provides the correct pH for the action of those enzymes; it converts a catalytically inactive proenzyme to an active enzyme and it destroys invading micro organisms in the stomach contents.
- As the stomach contents pass from the stomach to the small intestine, their acidity is raspidly neutralized by the addition of HCO_3 produced by the pancreas a good things to do because the mucosa of the small intestine has no other protection against HCl.
- Despite their sophistication, the stomach's protections are not infallible. Heliobacter pylori is a bacterium that thrives in the highly acidic environment of the stomach. An *H* pylori infection can start a lesion that *HCl* and digestive enzymes can exacerbates resulting.

CHAPTER-3
NATURAL FIBRES

A. Tick (✓) the correct option :

1. (d) 2. (d) 3. (d) 4. (b)
5. (d) 6. (c) 7. (c) 8. (a)
9. (a) 10. (a) 11. (d)

B. Fill in the blanks :

1. Pleece 2. Creamy white
3. mulberry 4. warm
5. pleece 6. Bombyx mori
7. high 8. landin
9. damaged

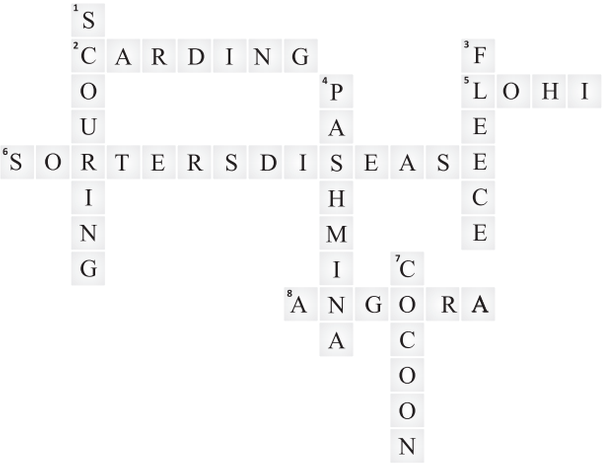
C. Write 'T' for True and 'F' for False statements:

1. (F) 2. (T) 3. (T) 4. (F)
5. (T) 6. (T) 7. (T) 8. (F)
9. (T) 10. (F)

D. Match the following :

1. (e) 2. (a) 3. (b) 4. (c)
5. (d)

E. Fill in the crossword with the help of clues :



DOWN

1. SCOURING
3. FLEECE
4. PASHMING
7. COCOON

ACROSS

2. CARDING
5. LOHI
6. SORTER'S DISEASE
8. ANGORA

F. Answer the following questions :

1. Wool is a fibre obtained from the fleece of sheep or goat. The fleece or hairs that cover the animal body trap in air and keep the animals warm. Four wool yielding animals are : sheep, goat, rabbit, camel and yak.
2. There are a number of properties that make it a very good fibre to use. Some of them are follows :
   (i) On account of the crimps, the wool is considerable resilient.
   (ii) It has a high tensile strength and elasticity.
   (iii) It is light weight and can be easily dyed.
   (iv) The wool fibre is the poorest conductor of heat of all the fibres used for clothing.
   (v) The woollen fabric dries much faster than the other fabrics. Thus the wool is convenient to use in winters.
3. The number of crimps per centimeter determines the fineness of wool fibre.

   Ex : Merino wool, wool from Alpaca, Llama and vicuna
4. Shearing is the process in which the fleece, along with a thin layer of skin, is removed from the body of the animal. The shearing is usually done in the warm weather. This fleece is generally cut close to the skin of the sheep and is generally removed in one piece.
5. Silk fibres are lustrous because of triangular prism like structure of the silk fibre, which allows silk cloth to refract incoming light at different angles. This produces different colons.
6. **Grading and Sorting :** The initial process in the processing of raw wool is sorting of woollen fibres. The fleece is pulled apart by hand and sorted into separate piles of similar nature, mainly on the basis of fineness, length and freedom from defects.
7. Two types of silk thread which is used in making of silk clothes are :
   (i) Organzine thread is made by giving raw silk thread, a preliminary twist in one direction and then twisting two or more of these threads in the opposite direction at a rate of about 4 turns/cm.
   (ii) **Tram :** Tram is made by twisting two or more raw silk thread in only one direction with 8 to 12 turns 1 cm.
8. Some cocoons are not boiled during the harvesting of silk thread because they are let to grow into pupa.

   This pupa help in the future harvesting of silk when they grow into a moth.
9. For killing the insect inside the cocoon the cocoons are boiled in water. The boiling hot water not only kills the insects within the cocoon, but dissolves a gummy substance that holds the cocoon filament.
10. **Define the terms :**
    (a) **Sericulture :** The rearing of silk worms is called sericulture.
    (b) **Scouring :** The process of washing fleece in tanks to remove dust and grease.
    (c) **Fleece :** The hairy skin of sheep is called fleece.
    (d) **Reeling :** The process of taking out threads from cocoon, for use as silk.
    (e) **Cocoon :** The covering around a caterpillar is called cocoon.
    (f) **Sorting :** The process of separation of different texture of having kind of sheep.

11. **Uses of wool :**
    (a) Wool felt is used to cover piano hammers. It is also used to absorb noise in heavy machinery.
    (b) Wool is used for making fabrics, shawls, blankets carpets, felt and upholstery.
    (c) Shoddy is made from the used wool.
12. Silkworm Moth (Bombyx mori) is the domestic moth whose larva produces silk.
13. **Scouring :** After sorting, the similar fibres are cleaned. It is because the raw wool contains ans oily substance called yolk. The yolk consists of a complex chemical called lanolin.

    In addition to yolk, the raw wool contains suints which is dried perspiration of sheep. The process of cleaning the raw wool is called scouring.
14. Wool has a greater bulk than other fabrics because the wool fibres are thicker than the other fibres. The wool fibre have larger volume and thickness as they are extracted from the animals while the other fibres are extracted from plants or insects.
15. **Raw silk :** Silk containing sericin is called raw silk.

    Extracting raw silk starts by cultivating the silkworms on mulberry leaves. Once the worms start pupating in their cocoons, these are dissolved in boiling water in order for individual long fibres to be extracted.

[HOTS]

- Woollen clothes are warm in winter because wool is a poor conductor of heat and it has air trapped in between the fibres.
- Grading and sorting is done during the processing of wool because this allows us to remove damaged or inferior wood. Also wool is sorted according to the length, colour and texture of fibres.
- Worsted wool is used for making uniforms for athletes because it is a fine quality wool that can be made into fine fabric. It keeps its from better.
- Shearing does not hurt sheep because the upper most part of the skin holding the hair is dead.

CHAPTER-4
HEAT AND TEMPERATURE

A. Tick (✓) the correct option :

1. (c) 2. (d) 3. (a) 4. (a)
5. (b) 6. (a) 7. (a) 8. (b)

B. Fill in the blanks :

1. best 2. Heat 3. 37°C
4. solids 5. pressure of the gas
6. vacuum

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

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

D. Write one word for the following :

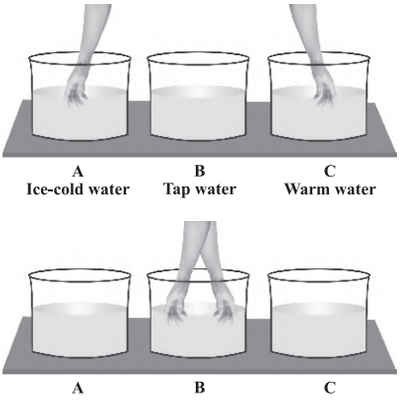
1. Temperature 2. Thermometre
3. Mercury 4. Conductor
5. Insulator 6. Radiation

E. Answer the following questions :

1. Heat is a form of energy which transfers from a hot object to a cold object.
2. By the help of given activity we can say that hot and cold are relative terms :

   Hot and cold are relative terms :

   - Take three vessels A, B and C. Fill A with ice-cold water, B with tap water and C with warm water.
   - Place your right hand is vessel A and left and hand in vessel C and Keep them these for sometime.
   - Then, place both you hand in tap water and vessel B. What do you feel?



- The same water in vessel B appears colder to the left hand and warmer to the right hand.
- Thus, the hand which was previously in contact with hot water will now feel cold whereas the other feels hot. This shows that the feelings of hot and cold are relative.

3. **Temperature :** The degree of hotness or coldness of body or substance called it temperature.

   Three scales are :

   (i) Celsius scale (ii) Fahrenheit scale

   (iii) Kelvin scale

4. Difference between Celsius and Fahrenheit scales are :

Celsius scale	Fahrenheit scale
1. On the celsius scale the melting point of ice is taken as 0°C and boiling point of water is taken as 100°C.	1. On Fahrenheit scale ice melts at 32°F and water boils at 212°F.
2. The distance between two points is divided into 100 equal divisions.	2. The difference between the two points is divided into 180° equal divisions. In other words, each division measures temperature difference of 1°F.

5. When we hat a solid, it melts on changes into a liquid and when we heat a liquid, it ultimately boils and changes into vapour.
6. From the sun the heat comes to us by another process known as radiation. The transfer of heat by radiation does not require any medium. It can take place whether a medium is present or not.
7. When supply heat to ice, to convert it to water, we increase the energy.

   Ice + Heat $\rightarrow$ Water

   Water + Hat $\rightarrow$ Steam

   Of the molecules of ice. Similarly, when we supply heat to water to convert it to steam, we increase the energy of its molecules. Thus, from above example we can say that heat is a from of energy.

8. **Sea breeze :** The air in contact with the land becomes hot and rises and cooler air above the sea rushes towards the land to take its place. This set up a convection current which we call a sea breeze.

   Land breeze : The air above the sea is warmer than that above the land. It rises, and the cooler air above the land moves out towards the sea. It is called land breeze.

9. (a) Utensil is are made of metal while their handles are made up of plastic because plastic is poor conductor of heat due to which the handles do not get heated and we are able to hold the utensils with their help.

   (b) It is preferable to wear light coloured clothes during summer as light colour reflects most of the heat and we also not feel mush of it.

[HOTS]

The cup with the spoon will cool faster as stainless steel spoon with conduct and absorb more heat.

CHAPTER-5
ACIDS, BASES AND SALTS

A. Tick (✓) the correct option :

1. (c) 2. (b) 3. (c) 4. (c)
5. (a) 6. (b) 7. (c) 8. (b)
9. (b)

B. Fill in the blanks :

1. acid 2. CO_2 gas 3. acidic
4. alkali 5. bees 6. carbonic
7. sour 8. red

C. Match the following :

1. (e) 2. (a) 3. (d) 4. (c)
5. (b)

D. Write 'T' for True and 'F' for False :

1. (F) 2. (F) 3. (F) 4. (F)
5. (T) 6. (T) 7. (T) 8. (T)

E. Write one word for the following :

1. Alkali
2. Indicator
3. Washing Soda or Sodium Carbonate
4. Mineral or Inorganic acid
5. Sodium (*Na*)

F. Answer the following questions :

1. **Acids :** Those substance which are sour in taste and react with base to form salt.

   Ex : Citric acid, Ascorbic acid are called acid.

   Base : Substances which are bitter in taste and feell soapy on touching are known as base.

   Ex : Calcium hydroxide, sodium hydroxide.

2. **Presence of Hydrogen in acids :** Acids are the compounds which have displayable hydrogen.

   Example : All acids sulphuric acid (H_2SO_4), Hydrochloric acid (HCl), Carbonic acid (H_2CO_3), Acetic acid (CH_3COOH) have hydrogen present in them.

3. Take a little hydrochloric acid sulphuric acid and nitric acid in 3 test tubes. Lable them 1, 2, 3 respectively. Add 2 drops of blue litmus in test tube 1, 2 drops of methyl orange in test tube – 2 and 2 drops of phenopthalene in test tube-3. You will see that blue litmus and methyl orange turn red and the third test tube remains colourless.

4. **Uses of acids :**
   a. Sulphuric acid is used as drying agent.
   b. Acids are used in refining of petroleum.
   c. Sulphuric acid is used in storage batteries.
   d. Hydrochloric acid is used to extract starch from glucose.
   e. Hydrochloric acid is used for bleaching in clothing industry.
   f. It is used in refining of common salt.
   g. Nitric acid is used in the extraction of metals.
   h. Nitric acid is used in the purification of precious metals like gold and silver.

5. In laboratory take a little powder of sulphur in a spoon and heat it over a burner. Sulphur starts burning. Bring the burning sulphur inside a gas jar filled with oxygen and cover the jar tightly. Sulphur reacts with oxygen to from sulphur dioxide. Its white smoke fill the jar. Take out the spoon and tightly close the lid of the jar. Put a little water in the jar. Sulphur dioxide is dissolved in water to form sulphurous acid.

6. **Neutralization process :** The reaction in which an acid reacts with a base to form salt is called neutralization reaction.

   Experiment : Take 10 ml dilute solution of caustic soda in a beaker. Add 2-3 drops of phenolphthalene solution in it. The alkaline solution of caustic soda turns pink. Add dil HCl drop by drop till the pink coloured solution becomes colourless. Keep stirring the solution with a glass rod.

   Now, add a drop of caustic soda, the colourless liquid again turns pink. On adding a drop of HCl, it once again turn colourless. Caustic soda and Hydrochloric acid nullify each others properties.

7. **Strong acids :** Some acids react strongly with other chemicals. These acids are called strong acids. Ex. : Sulphuric acid, nitric acid and hydrochloric acid.

   Weak acids : Some acids reacts very slowly with chemicals. These are weak acid.

   Ex : Acetic acid, citric acid and carbonic acid.

8. Salts are of three kinds.
   (i) **Neutral salts :** These salts are formed as a result of neutralization reaction of a strong acid with a strong base.

   Ex. Sodium chloride (NaCl), Sodium Sulphate (Na_2SO_4).

   (ii) **Acidic salts :** These are formed as a result of the neutralization reaction of a weak alkali and a strong acid.

   Ex. : Ammonium chloride (NH_2Cl)

   Ammonium sulphate $(NH_4)2SO_4$.

   (iii) **Basic salts :** Basic salts are formed as a result of the neutralization reaction of a weak acid and strong alkali.

   Ex : Sodium acetate (CH_3COONa)

   Sodium hydrogen carbonate ($NaHCO_3$)

9. **Concentrated acids :** Some acids have very small amount of water and their effect is very intense. These acids are called concentrated acids.

   Dilute acids : By mixing sufficient amount of water in concentrated acid and stirring it continuously, it becomes dilute acid. Dilute acids are not every strong.

10. The inorganic acids are corrosive especially in high concentrations, they will destroy body tissue and cause chemical burns when in contact with the skin and mucous membranes. In particular the danger of eye accidents is pronounced.

11. **Acids :** Those substance which are sour in taste are called acids. Two acids and their chemical formula are :
    - Sulphuric acid H_2SO_4
    - Nitric acid HNO_3

12. **Bases :** Substance which are bitter in taste and feel soapy on touching are known as bases.

    Two bases and their uses are :

    (i) **Washing soda or sodium carbonate (Na_2CO_3) :** It is used to test the presence of carbon dioxide, remove acidity, prepare bleaching powder and for white washing.

    (ii) **Caustic Soda (Sodium Hydroxide (NaOH) :** It is used to make soap, paper, rayon and medicines.

[HOTS]

- The Taj Mahal is turning yellow mainly due to these reasons-air pollution, discoloration of marble due to oxidation of its constituents, environmental neglect.
- When ammonia based fertilizers added to the soil it reacts with water to form ammonium-N, which is an alkaline reaction that initially raises the pH of the soil. However, as ammonium–N undergoes nitrification acidity is produced.

CHAPTER-6
PHYSICAL AND CHEMICAL CHANGES

A. Tick (✓) the correct option :

1. (c) 2. (d) 3. (b) 4. (a)
5. (a) 6. (c) 7. (b)

B. Fill in the blanks :

1. reactant 2. galvanization
3. Rust
4. Magnesium Oxide (*MgO*)
5. physical changes 6. Most

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

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

D. Answer the following questions :

1. When surface of brinjal or potato cut it turns brown because the enzyme called polyphenal oxidase contained in the cells is exposed to and reacts with the oxygen in the air. This reaction is called oxidation which turns the cut surface of brinjal or potato brown.
2. **Characteristics of physical change :** Physical changes are temporary, reversible and amount of energy absorbed or evolved is usually very small.
3. Burning of substance is a chemical change because in this new substance will form. We known that in chemical change new substance in formed so it a chemical change.
4. **Rusting of Iron :** Corrosion of Iron is know as rusting of Iron.

   In process of rusting, oxygen and water is essential.
5. Burning of paper is a chemical change because in this a new substance is formed while cutting of paper into pieces considered as a physical change because in this only physical property of paper is change and no new substance is formed. So these are considered as two different types of changes.

6. The method of separation of pure crystals of a substance from its hot and super saturated solution on cooling is called crystallization.

7. Three differences between physical change and chemical change are :

Physical change	Chemical change
1. Those changes in which no new substances are formed are called physical change.	1. Those changes in which a new substance is formed is called chemical change.
2. This types of change is reversible.	2. This type of change is irreversible.
3. Physical changes are temporary.	3. Chemical changes are permanent.

8. Take a cupful of water in a beaker and add a few drops of dilute sulphuric acid. Heat the water. When it starts boiling add copper sulphate powder slowly while stirring continuously. Continue adding copper sulphate power till no more powder can be dissolved. Filter the solution allow it to cool. Do not disturb the solution when it is cooling. Look at the solution after some time. In this way we can obtain a crystals of alum.

9. Sea water is allowed to evaporate by using the energy of the sun. As the water gets evaporated salt particles bind together to form cubical crystals.

10. (a) Chemical change
    (b) Chemical change
    (c) Physical change
    (d) Physical change
    (e) Physical change
    (f) Chemical change
    (g) Chemical change
    (h) Chemical change

11. Sublimation is a physical change because when a substance sublimes, it changes from a solid to a gas without going through the liquid phase. This does not result in a chemical change.

12. Characteristics of chemical change are :
    Changes in colour, temperature, the production of light, changes in odor and formation of gases.

[HOTS]

- Rusting of iron is more frequent near coastal areas in comparison to desert areas because in coastal areas air is most due to presence of water vapour. It increases the rate of rusting.
- Sea water is saline because when the rivers discharge themselves in the sea, they bring along dissolved salts especially the common salt. When the sun rays evaporates sea water, the salts are left behind in sea water.

CHAPTER-7
SURROUNDING AFFECT THE LIVINGS

A. Tick (✓) the correct option :

1. (c) 2. (c) 3. (a) 4. (a)
5. (b) 6. (c) 7. (a) 8. (c)
9. (a) 10. (a) 11. (d)

B. Fill in the blanks :

1. Weather 2. Humidity
3. climatology 4. equator
5. tilt 6. Polar bear
7. climate 8. polar
9. rain gauge 10. climate change

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

1. (T) 2. (T) 3. (F) 4. (F)
5. (F) 6. (F)

D. Match the following :

1. (c) 2. (e) 3. (b) 4. (a)
5. (d)

E. Write one word for the following :

1. Evolution 2. Rain shadow
3. Camel 4. Climate
5. Nocturnal animals

F. Solve the crossword puzzle given alongside with the help of the clues given below :

Across

2. Deserts 5. Migration
6. Climate 7. Hygrometer

Down

1. Weather
3. Humidity
4. Camouflage

G. Answer the following questions :

1. (a) Thermometer (b) Hygrometer
   (c) Rain gauge
2. Factors that affect the climate of a particular place are :
   (i) **Distance from the sun :** The climate of a place depends on the distance from the sun. It the distance is body far from the sun, the climate is much cooler as compared to place which is near to it.
   (ii) **Temperature :** The temperature on any particular day depends on the amount of sunlight received.
   (iii) **The Earths Tilt** : Tilt in the earths axis that causes the occurence of seasons on the earth.
   (iv) **Human factors** : Human factor is also becoming the most important in affecting the climate. humans are artificially producing more and more green house gases. Which is increasing the temperature and changes in climate are occurring.
3. Polar bears are adapted to live in the polar region in many ways. They have white fur so that they are not easily visible in the snowy white background. It protects them from their predators. It also help them in catching their predators. To protect them from extreme cold, they have two thick layers of fur. They also have a thick layer of fat called blubber under their skin. Their wide and large paws help in not only swim well but also walk with ease in the snow.
4. Adaptations are ways that make it possible for an animal or plant to live in particular place.
5. Tropical rainforest has a large population of animals because these rainforests normally grow in regions of strong sunlight, good rainfall and warm temperature throughout the year. They have plenty of food for animals.
6. Migration is a method to escape the harsh and cold conditions.
   Ex. Siberian Crane, Amur falon, flamingo
7. The "Lion tailed Macaque" has baboon like face. It is a good climbers and spend a majority of its life on the trees. It feeds mainly on fruits. It also eats speeds young leaves, stems flowers and buds. That is how it has adapted itself to live in the tropical rainforest.
8. Desert animals get water from the plants they eat particularly succulent ones. Desert animals like camel can drink 50 litres of water in one gulp whenever water is available. It excretes very little water and does not perspire, so there is no water loss the through sweating. Some animals scales or cuticle does not allow water to evaporate from body surface.
9. Hibernation is a state of in activity among animals. During hibernation, the heart beat slows down, body temperature lowers and the animals does not move. This helps the animal to conserve energy.
10. Global warming is the long term rise in the average temperature of the Earth climate system. It is a major aspect of climate change and has been demonstrated by direct

temperature measurement and by measurement of various effect of the warming.

11. **Weather :** Change that take place in the atmosphere at a given place and time is called weather.

Climate : Climate refers to the weather conditions of a place over a long period of time.

[HOTS]

- It is necessary to adopt features of climate because all living organisms are affected by the climate in which they live. In order to live successfully and comfortable in a particular climate it is essential that the living organisms both plants and animals, develop some special feature to live in the climate.
- It is a tough competition in hot tropical climate because the rich variety of plants and animals are found due to the continous warmth and rain. The trees grow close to each other and their broad leaves term a thick over head covering called a canopy that block sunlight from reaching the forest floor. There are variety of animals are found so, there is intense competition for food and shelter.

CHAPTER-8
SOIL — FORMATION AND UTILITY

A. Tick (✓) the correct option :

1. (d) 2. (b) 3. (b) 4. (a)
5. (a) 6. (c) 7. (a) 8. (b)
9. (d) 10. (a) 11. (c) 12. (c)
13. (d)

B. Fill in the blanks :

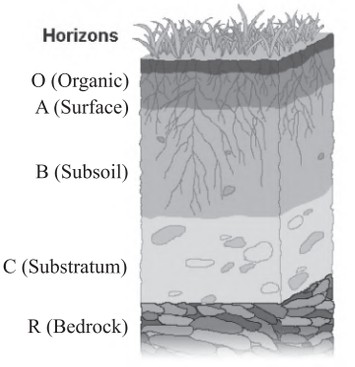
1. Soil 2. uppermost
3. Water 4. Horizones
5. soil 6. clayey

C. Write 'T' for True and 'F' for False :

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

D. Answer the following questions :

1. **Soil :** The uppermost layer of the Earths crust in which plant grow is called soil. Soil are named and classified on the basis of physical and chemical properties in their horizons (layers). Soil Taxonomy uses colour, texture, structure, and other properties of the surface two meters to key the soil into a classification system.
2. Soil formation is a slow and stepwise process. Soil is formed by the breaking down of rocks by the action of wind, water and climate. This process is called weathering. The earth has number of rocks which breaks into pieces and are slowly decomposed by chemical, mechanical and biological method.
3. Humus is formed from the dead and decaying matters of plants and animals which are left in the soil and later gets mixed with the soil to form humus. This humus is helpful to plants as it makes the soil fertile.
4. C-horizon of soil is poor in humus.
5. A vertical section that show the district layers of soil when we cut straight down into the soil is called a soil profile.



It has the following horizons.

O-horizon : The surface of the earth contains many plant roots and soil micro-organisms.

A-horizon : The top soil has lot of humus and its greyish in colour, and contains many of the minerals.

B-horizon : It contains less humus it is lighter in colour than the upper layer. This layer have very little organic matter.

C-horizon : The weathering of rocks take place in this horizon and the parent rock is being broken down.

Bedrock : Below the C-Horizon, it is bed rock layer which contains the parent rocks.

6. To find out the moisture content of a soil sample :
   - Take 200 gm of soil.
   - Place it on a newspaper in the bright sun for about two hours.
   - Now weigh the soil you find and difference in the weight of the soil. The difference in the weight of the soil before and after drying given you the amount of moisture present in 200 gm of soil.

     You can calculate the percentage moisture content as follows :

     Original weight of soil = 200 gm

     Final weight of soil = X gm

     Weight of moisture = (200 – X) gm

     Percent of moisture in soil

     $$= \frac{\text{Weight of moisture (gm)}}{\text{Original weight of soil sample (gm)}} \times 100$$

     This activity proves the soil contains moisture.
7. Factors that affect soil formation are :
   (i) **Climate :** Temperature, rain, wind etc. play an important role in loosening and breaking up of rocks climate determines the speed of chemical reactions and thus controls chemical weathering.

   (ii) **Slope of land :** The physical features also play an important role in the formation of soil.

   The running water and wind takes away the soil on to the plain area and from a thick layer.

   (iii) **Parent rocks material :** The characteristics of the parent rocks also determine the kind of soil formed.
8. **Soil Erosion :** Removal of soil by wind and water is called soil erosion.

   Causes of soil erosion :

   (i) **Deforestation :** The removal of trees on a large scale is known as deforestation. When trees are removed, soil particles are left loose and can be easily carried away by water and wind.

   (ii) **Floods and heavy rainfall :** It causes a lot of damage to the soil especially where there are no trees.

   (iii) **Overgrazing :** Overgrazing by large animal populations has also developed vegetation and resulted in barren lands. Barren land are liable to erosion by strong winds.

   (iv) **Improper farming :** Another factor contributing to soil erosion is the poor farming methods. Ploughing loosens the soil and destroys its natural structure.
9. The types of soils found in India are :

   (i) Clayey soil (ii) Sandy soil

   (iii) Loamy soil (iv) Desert soil

   (v) Red soil (vi) Laterite soil

   (vii) Black soil (viii) Alluvial soil

   (ix) Mountain soil
10. **Soil pollution :** Unwanted and harmful substances are added to the soil that reduce its fertility. This is known as soil pollution.

    Control of soil pollution : Some of the important steps are to be taken.

    1. Solid wastes should not be dump on land. Proper disposal of sewage should be adopted.
    2. Chemical fertilizers should not be added in excess to the soil.
    3. Animal and domestic wastes should be used to produce bio gas.
    4. Liquid wastes from factories and mines should be properly treated before they are released into water bodies.
11. Short notes on :

    (a) **Soil erosion :** Removal of soil by wind and water is called soil erosion. It happens in place where soil is not converted by plants.

(b) **Humus :** It is formed from dead and decaying matters, of plants and animals which are left in the soil and later get mixed with the soil to form humus.

(c) **Loamy soil :** This types of soil consists of a good mixture of sand, clay and humus. It is porous and also holds moisture and air circulation is also sufficient .It has sufficient minerals for plants.

(d) **Afforestation :** The process of planting trees in large number on deforested land in called afforestation.

(e) **Weathering :** It is the disintegration of rocks on the Earth's surface caused by exposure to natural forces such as wind, water, frost, roots of plants.

(f) **Clayey soil :** In this type of soil, the soil in extremely sticky and hence cultivation is difficult. Dry clayey soil becomes very hard and forms deep cracks.

[HOTS]

1. This is so because contains more organic material than the subsoil and so it is darken in colour. Humus is the decayed remains of the plants and animals, which breaks down in the soil by the microbes. Therefore, this happens more in the topsoil, than in any other soil layer.
2. We cannot make pots with sand because the particle are so big and rough and they are loosely packed, Whereas in a clayey soil that particles are closely bounded and they become hard on drying.
3. Sample B is the best sample and suitable for growing plants because it has a maximum capacity to absorb water slowly-slowly in maximum time which suits plant a lot.

CHAPTER-9
REPRODUCTION

A. Tick (✓) the correct option :

1. (a) 2. (c) 3. (a) 4. (d)
5. (a) 6. (a) 7. (c) 8. (b)

B. Fill in the blanks :

1. Reproduction 2. Onion and tulips
3. unisexual 4. Ovary
5. Ovary 6. reproduction
7. artificial

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (T) 4. (F)
5. (F) 6. (F)

D. Solve the crossword puzzle with the help of given clues :

		L			[8]P			[9]G				[10]X
[1]P	O	T	A	T	O			R				A
[2]F	E	[7]R	T	I	L	I	Z	A	T	I	O	N
	[3]D	A	H	I	L	A		F				T
		D			I			T				H
		I			N			I				I
[6]Y		C			A			N				U
E		L			T	[4]A	L	G	A			M
A	Y	E			I							
S					O							
T					[5]N	E	C	T	O	R		

Across

1. Potato 2. Fertilization
3. Dahlia 4. Alga
5. Nector

Down

6. Yeast 7. Radicle
8. Pollination 9. grafting
10. Xanthium

E. Match the following :

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

F. Write one word for the following :

1. Germination 2. Ovary
3. Tubers 4. Buds
5. Asexual reproduction

G. Answer the following questions :

1. **Reproduction :** All living organisms reproduce to given rise to young ones of their own kind. Such production of new individual from the parents of the same species is called reproduction.

2. **Fertilization :** The process of fusion of male and female gametes is called fertilization.

   In animals, there are two types of fertilization–Internal fertilization and external fertilization.

   Amphibians and most fish use external fertilization. Some animals with internal fertilization given birth to live offsprings. Other such as birds, most reptiles and some mammals such the platypus lay eggs.

3. Natural mean of vegetative reproduction are :

   (i) **By leaves :** Bigonia and Bryophyllum are some of the plants in which buds are produced at the end of the leaves. When any of their leaves falls at a moist place, dust particles deposit over it. In this situation, these buds are developed into small plants.

   (ii) **By stems :** Buds are developed in the stems of some plants. This stem with a bud acts as an organ of vegetative reproduction in favourable conditions.

4. **Sexual reproduction :** It involves fusion of male and female gamete.

   In asexual reproduction only a single parent cell is required while sexual reproduction involves male and female parents. There are many methods of asexual reproduction while in sexual reproduction only one method is required. Asexual reproduction is generally found in lower organisms.

   On the other hand sexual reproduction is generally found in higher organisms.

5. When an insect settles on a flower to suck the nector, the pollen grains of flower stick to its body, legs and wings. When that insect visits another flower, it leaves some pollen grains on the stigma of the flower. In this way, the cross pollination of that flower takes place.

6. **Pollination :** The transfer of pollen grains from another to the stigma of the same flower to different flower is called pollination.

   In the ripe part of the flower a yellow coloured power is formed which has pollen grains. These pollen gamete fuses with female gamete or the ovule present in the ovary and fertilizes it.

   Seed : Every fertilized ovule of a plant is called seed.

7. **Vegetative reproduction :** This is the process in which plants reproduce without the help of their reproductory organs with the help of their roots, stems and leaves.

   Artificial means of vegetative propagation.

   These means are as follows cutting : This method of vegetative reproduction is used to grow plants of potato, rose, sugarcane etc. In this method, the stem is cut into smaller pieces having at least two nodes and a bud, on sowing these cuttings into moist soil given birth to new plants.

   Grafting : This is the method of improving the quality of plant in which branch of higher plants is grafted on the root of lower quality plant.

   Tissue culture : It is a modern method in this method, a small tissue of the plant is dipped in a suitable medium containing nutrients and hormones.

   Layering : It is an artificial method of vegetative reproduction in which the roots of other plants are developed from some other part of the stem of the parent plant from which roots of the new are developed is called layering.

8. **Female reproductive system :** There are many organs in female reproductive system.

   (i) **Ovaries :** There is a pair of ovaries in the abdominal cavity ovum and female hormones are produced by ovaries.

   (ii) **Oviducts :** Eggs released from the ovary are collected in a part spread like a funnel. Oviducts are curved tubes. Ovum is fertilized by the sperm in the oviducts.

(iii) **Uterus :** Both the oviducts open into a large sac of muscles called uterus. It is attached to the vagina. The fertilized egg is zygote which develops to form an embryo. The embryo develops in the uterus.

[HOTS]

Farmers leave space while sowing seeds to give the plant enough space to grow and expand. This prevents over crowding of plants and ensures proper growth.

CHAPTER-10
TIME AND MOTION

A. Tick (✓) the correct option :

1. (c) 2. (a) 3. (b) 4. (a)
5. (c)

B. Fill in the blanks :

1. Time 2. Pendulum clock
3. m/s 4. balance wheel
5. constant

C. Write 'T' for True and 'F' for False :

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

D. Answer the following questions :

1. We measure time for different reasons. Some of these reasons are :
   - Doctors need of measure the number of times the heart beats in one minute for a patient.
   - Farmers need the measure the time between sowing and harvesting of crop.
   - Students need to measure time to complete an exam.
   - A traveller needs to measure the time of this journey.
   - A sports man needs to measure the time he might take to complete an event.
2. A state of motion is defined by the velocity of the object. Speed is measured by the time an object take to go over a certain distance. This is why the relation between time and motion is that of conceptual, inseparability than physical.
3. A distance time graph shows how for an object has travelled in a given time. It is a simple line graph that denotes distance versus time findings on the graph. Distance is plotted on the y-axis. Time is plotted on the x-axis.
4. Characteristic of oscillation are as follows.
   (a) The time taken for a pendulum to complete one oscillation does not depend on the extent to which the bob of the pendulum is displaced.
   (b) The time period does not depend on the mass of the bob used.
   (c) The time period depends on the length of the string on wire used greater the length of the string greater is the time period.
5. Speed is defined as the ratio of the total distance travelled by a body to the total time.
   Taken to do so. It is also defined as the distance travelled in a unit time.
   The unit of speed in the SI system of units is m/s.
6. Motion repeated in equal intervals of time is called periodic motion.
   Ex : By a rocking chair, a bouncing ball, a vibrating turning fork, a wing in motion and a water wave.
7. As we know that speed is the distance travelled divided by the time taken.
   For bullock cart speed = 10 km/hr.
   time taken = 35 minutes
   Distance = Speed × time
   $$\frac{1000}{6} \times 35 = \frac{35000}{6}\text{m} = \frac{35}{6}\text{km}$$
   Again Speed = 12km/hr
   $$= \frac{\cancel{12000}^{200}}{\cancel{60}}\text{m/min}$$
   Time = 15 min
   Distance = Speed × Time
   = 200 × 15
   = 3000m or 3 km
   Total distance = $\frac{35}{6} + 3 = \frac{53}{6}$ km

8. **Uniform motion :** A body is said to be in uniform motion it covers equal distance in equal intervals of time.

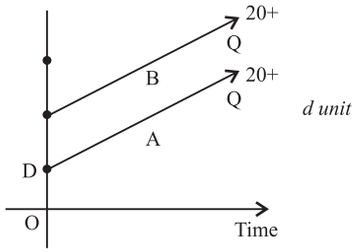
Ex : Movement of hands of a watch, rotation and revolution of the earth.

Non-uniform motion : When a body covers unequal distance in equal intervals of time the body is said to be in non-uniform motion.

Ex : Football in a ground the motion of car in traffic.

[HOTS]

Let at time + = 0, A is at a distance OB.



CHAPTER-11
ELECTRIC CURRENT AND CIRCUITS

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (c) 4. (c)
5. (b) 6. (c) 7. (b)

B. Fill in the blanks :

1. Atom
2. Dry cells
3. battery
4. Fuse
5. magnetic

C. Write 'T' for True and 'F' for False :

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

D. Give one word from each of these.

1. Fuse
2. Battery
3. Electric Bulb
4. Electromagnetic Games
5. Current

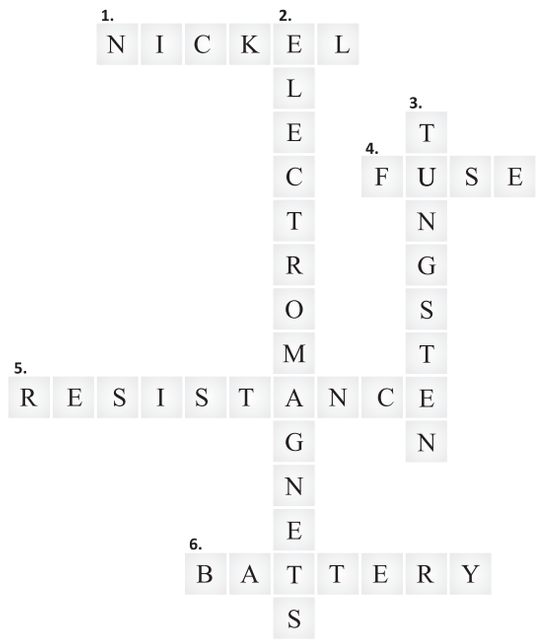
E. Solve the crossword puzzle given alongside with the help of the clues given below :

Across

1. Nickel
4. Fuse
5. Resistance
6. Battery

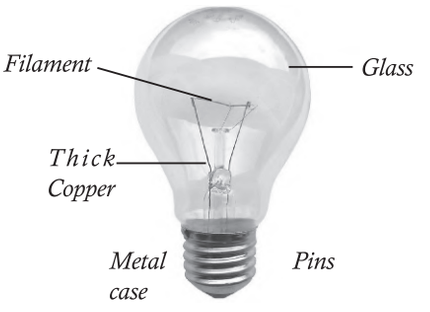
Down

2. Electromagnets
3. Tungstem



F. Answer the following questions :

1. **Electric circuits :** The unbroken path through which an electric current can flow is called an electric circuit.
2. In Iron and room heater only heating effect of current is used.
3. **Structure of an electric bulb :** An electric bulb at the base, they have two metal contacts, which connect to the end of an electric circuit. The metal contacts are attached to two stiff wires, which are attached to a thin metal filament. The filament sits in the middle of the bulb, help up by a glass mount.



4. Symbols for the following electric elements are :

(a) Resistance =
(b) Battery =
(c) Ammeter =
(d) An open switch =

5. **Electric fuse :** It is a thin piece of wire designed to carry a limited electrical current. It you try to pass higher current through the wire, it will heats up so much that is burns or melts. When it melts, it breaks the circuits its fitted to and stops the current from flowing.
6. **Working of an electric bell :** When the switch is pressed into the ON position, the circuit gets complete and current starts flowing in it. As a result, the soft iron rods, with the wire wrapped around them, start behaving as electromagnets. They attract the armature towards themselves, one of the armature moves towards the gong and strikes it producing the sound. Second the connecting between the armature and the contact screw breaks. As a result there develops a gap in the circuit and current stops flowing. Due to this, the soft iron with the coil around it stops behaving like a magnet and the armature return to its original position due to spring to spring action. The process repeats when the switch is pressed again.
7. Define the terms.
   (a) **Current :** Movement of charges through a body and the flow of electric change is called current.
   (b) **Electromagnet :** An electromagnet is made by winding a large number of turn of an insulated copper wire on a soft iron core.
   (c) **Electric fuse :** It is a soft device that is used in household circuits to protect the appliance. It prevent them from getting burnt out in case of excess current flowing through the circuit.
   (d) **Electromagnet :** An electromagnet is made by winding a large number of turn of ain insulated copper wire on a soft iron core.
   (e) **Battery :** Combination of two on more cells is called battery.
   (f) **Open electric circuit :** It is a circuit through which no current is passed.

[HOTS]

1. I would say never replace a fuse with a piece of wire. In case of copper wire. Copper wire cannot be used a fuse wire because it has a high melting point. It will not melt easily where a high electric current passes through it and may damage the electrical appliances.
2. (a) Nichrome (b) Tungsten
3. (a) No (b) CBA

CHAPTER-12
WINDS, STORMS AND CYCLONES

A. Tick (✓) the correct option :

1. (d) 2. (a) 3. (c) 4. (a)
5. (c) 6. (a) 7. (b) 8. (a)
9. (b)

B. Fill in the blanks :

1. Air
2. colourless, odourless, tasteless
3. cyclone 4. high, low
5. cyclone 6. wind
7. Cyclone

C. Write 'T' for True and 'F' for False :

1. (T) 2. (F) 3. (T) 4. (F)
5. (T) 6. (F) 7. (F)

D. Short answer type questions :

1. (a) Wind (b) Tornado
   (c) Anemometer (d) Cyclone
   (e) Eye
2. Two examples which show that air exerts pressure are:
   (i) We can feel the force exerted by air on our face when we sit on a fast riding motorbike.
   (ii) Air exerts pressure against the sails, they move in the direction in which the air is blowing and thus carry the boat forward.
3. **Sea breeze :** The air in contact with the land becomes hot and rises and cooler air above the sea rushes towards the land to take its place. This set up a convection current which we call a sea breeze.

E. Answer the following questions :

1. **Atmosphere :** The cover of air surrounding the Earth is called atmosphere.

   Composition of air : Atmosphere is composed of the following molecules components. nitrogen 78% oxygen 21%, organ 1%, and then trace amounts of carbon dioxide, neon, helium, methane, krypton, hydrogen, xenon, ozone, iodine, carbon mono oxide.

2. **Wind :** The moving air is called wind.

   Characteristics of wind : It has two important characteristics.

   Direction and speed. The direction of wind can be gauged using an instrument called the wind vane. It is also called a weather vane.

3. Take two equal sized blown balloons and suspend them from a rod.

   Blow in between the balloons and observe. The balloons move towards each other. This can be explained as follows. When the air is blown fast in between the two balloons the air pressure get reduced there are the higher pressure on the either side pushes the two balloons close.

   By this activity we proved that the increased wind speed is accompanied by a reduced air pressure.

4. **Damages caused by cyclones are :** When a cyclones strikes, trees can be uprooted and buildings flattened.

   The water surface is lighted up due to the low pressure in the eyes as high as 3-12 metres. It appears like a water full moving towards the shore. As a result the water enters the coastal areas causing severe loss of life and property. Continuous rainfall many worsen the situation damaging houses, telephone lines, trees, crops of the field.

   Effective safety measures :

   - Remove any dead trees or over hanging branches.
   - You should move to room on the ground floor and get under a heavy piece of furniture.
   - Stay indoors as for as possible.
   - Switch on the battery operated radio and tune in local weather forecasts.
   - People in low lying areas and near the coastline should be evacuated.
   - Avoid driving on roads through standing water such as floods.

5. The swift movement of the falling water droplets along with the rising air create lightning and sound is called thunderstorm.

   A thunderstorm is a combination of wind formed by two alternative coming winds are crashed they carry some clouds which are full of water so they start raining. The speed of the normal wind is different from that of the thunderstorms.

6. Two methods to find out that "air expands on heating" are as follows :

   (a) We might have noticed smoke coming out of a chimney in houses or in factories. The smoke always seems to go upwards because smoke from a chimney contains hot air particles. The surrounding air particles are cooler. As air expands on heating, hot air becomes light than the surrounding cool air.

   (b) Balloon which is fitted in a bottle on heating moves to occupy the space in the balloon.

   This shows that air expands on heating.

7. High speed wind blowing with lots of rain and sometimes thunder and lightening is called storm.

   Storms develop in hot, humid, tropical areas. The rising temperature produce strong upward winds. These winds carry water droplets upwards, where they freeze, and fall down again. A storm brings heavy rains, hailstones, lightning and thunder which high speed wind.

8. Tornado is a dark funnel shaped cloud with powerful twisting mass of air, the funnel sucks dust, debris, and everything near its base due to low pressure and throws them out near the top.

Tornadoes have diameters on the scale of 100s of meters and air produced from a single convective storm. A tropical cyclone however, has diameter on the scale of 100s of kilometers and is comprised of several to dozens of convective storms.

[HOTS]

Because the warm sea water, and the moist air it generates which is the source of cyclones forming does not exists on land. So when it reaches land the energy supply of the cyclone is cut off, leaving only the moist air to disperse over the land as rain.

CHAPTER-13 LIGHT

A. Tick (✓) the correct option :

1. (b) 2. (d) 3. (a) 4. (b)
5. (c) 6. (a) 7. (a) 8. (c)

B. Fill in the blanks :

1. Non-luminious 2. Sun
3. straight 4. Luminous Intensity
5. virtual and erect

C. Write 'T' for True and 'F' for False :

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

D. Answer the following questions :

1. **Lumnious object** : Objects which having their own light are called lumnious objects.

   Ex : The sun, stars, burning candle.

   Non-luminous objects : Object which do not have their own light but they reflect the light falling on them from some other sources are called non-luminous objects.

   Ex : moon, mirror, planet.

2. **Rectilinear propagation of light** : Light travels in a straight line. This straight line propagation is called propagation of light. This is evident from phenomena which occur in nature, namely formation of shadows and eclipses.

3. **Reflection of light :** A mirror bounces back the light falling on its surface. This bouncing off a light from a surface is known as reflection of light.

   Laws of Reflection : There are two main laws of reflection.

   (i) The incident ray, the reflected ray and the normal at the point of incidence all lie in the same plane.

   (ii) The angle of incidence (i) is equal to the angle of reflection (Ω) that is ($\angle i = \angle \Omega$)

4. To prove that light travels in a straight line.

   Material required : Three equal shaped cardboard, candle, matchstick, a scissors. Now with a scissor cut one hole in the centre of all three cardboards and place them in a straight line. Such that you are able to see through the three holes.

   Light the candle in front of the third cardboard and see the light of the candle through the three holes. Now shift the middle cardboard a little left ward and try to see the candle through the holes.

   Observation : You will observe that after shifting the middle cardboard, you are unable to see the light through the straight holes. It this way we can prove that light travels in straight line.

5. On the new moon day, when the sun, moon and the earth are all in a straight line, then solar eclipse its formed.

6. When a light wave with a single frequency strikes an object, a number of things could happen. The light wave could be absorbed by the object, In which case its energy is converted to heat. The light wave could be reflected by the object. And the light wave could be transmitted by the object.

7. A lunar solar eclipse occurs when the Earth comes between the moon and the sun and carts a shadow on the moon. Due to this, we cannot see the moon. Solar eclipse happens when the new moon moves between Earth and the sun.

8. Mirror is any plane surface that changes the direction of light falling on it.

   Properties of a good mirror :

   (i) It must not absorb light rays.

(ii) It should not allow light to pass through it.

(iii) It must reflect light rays.

9. Uses of concave mirror in daily life are :

(i) If is used in torch and search light. The silver polished concave surface behind their bulb acts as the reflector of light.

(ii) It is used in the head lights of vehicles like cars, scooters and trains.

Uses of convex mirror in day to day to life are : Convex mirrors are used as rear view mirrors in vehicles like car, scooter, bees, truck etc. The driver can know about the traffic behind him by looking into the rear view mirror.

10. Compare and contrast :

(a) Concave mirror	**Convex mirror**
1. A spherical mirror reflecting light from its inward surface.	1. A spherical mirror reflecting light from its outward surface.
2. A concave mirror forms a real and inverted image which may be diminished.	2. A convex mirror always forms a virtual, erect and diminshed image.
(b) Natural sources of light	**Artificial sources of light**
Some celestial bodies have their own light. These are called natural sources of light. Ex. : sun, moon, stars	Some other sources of light are artificial and man made source of light. Ex. : Burning candles earthen lamps, bulbs electric tubes.
(c) Luminous objects	**Non luminous object**
Object having their own light are called luminous objects. ex : The sun stars, firefly.	Objects which do not have their own light but they reflect the light falling on them from some other sources. These are non luminous object. ex : moon, mirror.
(d) Lunar eclipse	**Solar eclipse**
During the course of revolution, sometimes the earth comes in between the sun and the moon and moon is not visible due to shadow of the Earth this is called lunar eclipse.	On the new moon day, when the sun, moor and the earth are all in a straight line, moon casts its shadow on the. This is known as solar eclipse.
(e) Amavasya	**Poonima**
When the moon is between the Earth and the sun we cannot see it at all. This phase of moon is called new moon. This process is called amavasya.	When the full moon is visible, it looks like a complete circle. This phase of the moon is called full moon. This process is also called Poornima.
(f) Cool sources of light	**Hot sources of light**
Cool sources of light are those that do not require heat in order to produce light. ex. LED's fireflies, some algal.	Hot sources of light are those that emit heat. ex. light bulbs.

[HOTs]

- Concave lens forms a real image.
- Necessary condition for formation of real image is that there are has to be at least two light rays from each point. Two light rays at least are need from each of the top and bottom of the candle to form an image, otherwise the intersection of rays cannot be shown.

CHAPTER-14

WATER : A PRECIOUS RESOURCES

A. Tick (✓) the correct option :

1. (a) 2. (c) 3. (c) 4. (d)
5. (b) 6. (a) 7. (c) 8. (a)
9. (a)

B. Fill in the blanks :

1. sea 2. spillage
3. germination 4. sea
5. interchangeable

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (c) 2. (e) 3. (d) 4. (b)
5. (a)

E. Write answer in one word or one sentence :

1. Natural resources are materials or substances occurring in nature which can be exploited for economic gain.

   Ex. Water, air, light.

2. **Saturate solution :** When we dissolve salt in water keep on adding more & more salt till water stops dissolving salt in it. This solution is called the saturated solution.
3. **Electrolysis :** It is a process in which water is decomposed into hydrogen and oxygen gases by passing electric current.

$$2H_2O \xrightarrow[\text{Electric current}]{\text{Electrolysis}} 2H_2 + O_2$$

4. Water is a compound which are made up of Hydrogen and oxygen.
5. Fresh water of lakes, ponds, streams and river are called drinking water.

F. Answer the following questions.

1. Two elements of water can be separated by two methods :

   (i) **By heating water :** On heating water to a temperature more than 500°C, these two gases are separated.

$$2H_2O \xrightarrow[\text{Electric current}]{\text{Electrolysis}} 2H_2 + O_2$$

   (ii) **By Electrolysis :** By passing electric current in water, it is decomposed into hydrogen and oxygen gases.

$$2H_2O \xrightarrow[\text{more than 500°C}]{\text{Temperature}} 2H_2 + O_2$$

2. **Composition of water :** Water is a compound which is made up of two elements Hydrogen and oxygen.
3. **Water cycle :** Due to strong heat of the sun, the water of all water sources keeps evaporating continuously. Plants absorb water by the process of photosynthesis. The remaining water is transpired from the pores in their leaves and is thus returned to the atmosphere. The water enters the atmospheres and again comes back to the earth in the form of rain. This cycle is known as water cycle.
4. **Physical properties of water :** These properties are :

   (i) **Nature :** Pure water is colourless, odorless, tasteless and clear liquid water is transparent.

   (ii) **Boiling point :** Pure water boils at 100°C at a pressure of 760 mm of mercury. By heating more, water starts changing into water vapour.

   (iii) **Freezing point :** Pure water freezes at 0°C at 760 mm pressure of mercury.

   (iv) **Heat capacity :** The heat capacity of water is more than other liquids.
5. **Different sources of water :** Different sources of water are :

   (i) Rain water (ii) Surface water
   (iii) Ground water

   Rain water : Rain is caused by condensation of water vapour already present in air. The rain water is the purest from of water. But gets polluted with dust particles and dissolves gases as it falls down on the earth.
6. Main uses of water stored in dams are :

   (i) **Generation of Electricity :** The dam water is also used for power production. This hydro electricity is supplied to houses and industries.

   (ii) **Agriculture purpose :** To grow and sufficient food, water stored in a dam distributed to to fields through rivers and canals.

   (iii) **Industrial purposes :** The dam water is also used for many industrial purpose.

   (iv) **Domestic purposes :** The water from dam is supplied to cities and town bypipes.

This water is utilized for drinking, washing bathing and other purposes in houses.

7. **Electrolysis :** It is the process in which water in decomposed into hydrogen and oxygen gases.

   From electrolysis of water we get Hydrogen and oxygen in the ratio of 2 : 1.

$$\underset{\text{(water)}}{2H_2O} \xrightarrow[\text{Electric current}]{\text{Electrolysis}} \underset{\text{(hydrogen)}}{2H_2} + \underset{\text{(oxygen)}}{O_2}$$

$$\underset{\text{(ratio)}}{2 : 1}$$

8. Define the terms :
   (a) **Unsaturated solution :** The solution in which more amount of solute can be dissolved in is called unsaturated solution.
   (b) **Epidemics :** At a particular time the diseases spread among most of the people are called epidemics.
   (c) **Biogas :** It is a gaseous fuel, especially methane, produced by the fermentation of organic matter.
   (d) **Water table :** The topmost level of underground water is called water table.
   (e) **Desalination :** The process of removing dissolved salts from water is called Desalination.
   (f) **Miscible liquids :** Liquids which dissolve uniformly in water are called miscible liquids.

[HOTS]

1. The reasons for the dramatic decline in rainfall are disputed. Residents blame events beyond their control for the problems, they face– the place is hotter, drier, and shorter of water than even before. So Cherrapunji suffers acute water scarcity when the rainfall starts to drop sharply.
2. Because the water table gets lower than the inlet of the pump jet on the water table will become lower if over pumped or the number of wells in the area increases. More wells in an area will lower the water table as there will be bigger consumption from a well.

CHAPTER-15
FORESTS : OUR LIFELINE

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (c) 4. (c)
5. (b)

B. Fill in the blanks :

1. emergent
2. Spiders, Beetles, Grubs
3. agriculture expansion
4. sunlight
5. fibre 6. Boreal
7. Deforestation 8. Food chain

C. Write 'T' for True and 'F' for False :

1. (T) 2. (F) 3. (F) 4. (T)
5. (T) 6. (F) 7. (T)

D. Write in one word for the following :

1. Plants or Autotrophs
2. Understorey 3. Decomposers
4. Carbon dioxide 5. Forest floor

E. Answer the following questions :

1. A forest is a very large uncultivated piece of land which is densely covered with various types of herbs, shrubs, trees, tall grasses, creepers and climbers.
2. Trees in the forests help to regulate the climate of a place. They absorb water from the ground thought their roots and them releases some water as water vapour which helps in keeping air cool and help in bringing the rain.

   They also regulate oxygen and carbon di oxide in the atmosphere.

   Animals take in oxygen and release carbon dioxide in the atmosphere. This carbon dioxide is then taken by the leaves of the trees to produce food by photosynthesis.
3. Forests are important for the following :
   (i) **A source of food :** We get fruits and mostly dry fruits from the forests.
   (ii) **Regulate climate :** Forests also regulate oxygen and carbon.

(iii) **A source of medicine :** It is a source of variety of medicinal plants.

(iv) **A source of wood :** Dense forests are rich source of wood. i.e. timber. A variety of trees growing in the forest produce good quality of wood.

(v) **Prevent soil erosion :** Forest prevent soil erosion and floods : Trees help to control soil erosion.

(vi) **Source of fibre :** We also get fibre from several plants growing in forests.

(vii) **Air purifier :** The forests act as a huge lungs by cleaning up the air for us and providing oxygen.

(viii) **Source of fuel :** Wood is the most important source of fuel used for cooking in several rural areas.

(ix) **Source of Raw material for Industries :** Forests provide us with useful products like wood, rubber oil, fibres like jute etc.

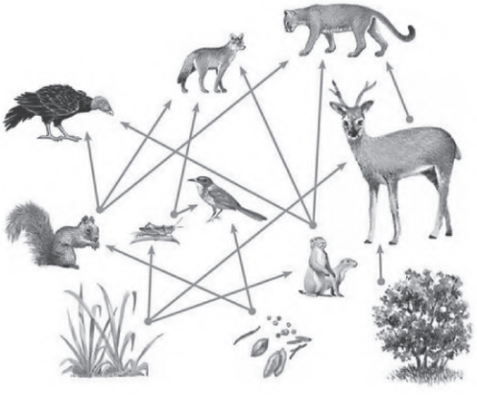
4. Following will happen if all the forests disappear :

Loss of bio diversity : Plants and animals will lose their food and shelter.

Floods : Bald hills and mountains can no longer hold back sudden flow of water which will cause floods

Increase in carbon dioxide : Depletion of forests results in increase in carbon dioxide which will cause global warming.

5. **Food chain :** A food chain shows the relationship between animals in a certain habitat and the food that they eat.



Example, if there are too many lions in the forest, there will not be sufficient deer for all of them to eat. Some lions therefore, starve and die and there will be fewer lions and once again the forest will have a good growth of deer.

6. **Dependence of animals on Plants :** Animals depend upon plants in various ways.

(i) All animals depend for their food directly or indirectly on green plants. Only green plants are capable of preparing their own food through photosynthesis using water and carbon dioxide in the presence of sunlight.

(ii) Shelter is the another important factor for animals to live. They totally depend on plants for shelter. Dependence of plants on animals : It is same for plants.

(iii) Animal bodies after death are decomposed by the decomposers. i.e. bacteria and fungus in soil convert into simpler substance which in turn are taken by the plants from the soil.

(iv) Animals can carry fruits and seeds from one place to another. When they eat these fruits they drop seeds elsewhere. The disposal of seeds and fruits help in growing the new plants.

7. Trees helps to control soil erosion by the action of strong winds and water currents. Roots of the trees bind the soil particles together and prevent the soil erosion. Trees help in improving the soil quality.

8. Human activities such as agricultural expansion, cattle breeding, timer extraction mining oil extraction, dam construction and infrastructure development damage a forests.

9. Define the terms :

(a) **Afforestation :** Special drives of planting more and more trees to save environment from the bad effects of deforestation is called afforestation.

(b) **Heterotrophs :** An organism deriving its nutritional requirements from complex organic substances.

(c) **Deforestation :** Deforestation happens when humans remove or clear large areas of forest land and related ecosystems for non-forest use.

(d) **Food web :** Interconnected food chains from of food web.

(e) **Humus :** A substance made from dead leaves and plants that you put into the ground to help plants grow.

[HOTS]

1. When one of the link in a food chain is no longer present, the food chain breaks. Sometimes, this can cause other animals in the food chain to disappear as well ans the whole ecosystem can become imbalanced or even collapse.
2. This is true that forest has no waste because all the waste produced in the forest is biodegradable like dead plants and animals and dropping of animals and birds, so they are decomposed by microorganisms and mixed with soil. There is no human population living in the forests, so there are no wastes in the forests.

CHAPTER-16

JOURNEY OF WASTE WATER

A. Tick (✓) the correct option :

1. (a) 2. (d) 3. (a) 4. (d)
5. (d) 6. (d)

B. Fill in the blanks :

1. Waste water 2. domestic sewage
3. solid 4. Scraper
5. Aerobic

C. Write 'T' for True and 'F' for False :

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

D. Answer the following questions :

1. Waste water is defined as the dirty water that runs down the drains from the kitchen sinks and bathroom.
2. **Natural alternative : Septic tanks :** In septic tanks, the sewage in sent directly into a tank in which anaerobic bacteria decompose waste. In another method, the excreta is allowed to flow into a bio gas plant through covered drains.

   Vermicomposting : In this method red worms are used to treat human excreta and convert it into a harmless mass called vermicompart. vermicompost can be used as a manure for plants.
3. The waste water is passed through a sedimentation tank called a clarified tank. In this tank, the solid organic matter settle down which is them removed with a scraper. The solid organic matter that settles down is called sludge. The next step involves the breaking down of organic matter by the action of bacteria. This can be done in open tanks called aeration tanks. Anaerobic bacteria are used to break down the organic matter dissolved in sewage. The process takes place in classed tanks or chambers.
4. Primary sludge is a result of the capture of suspended solids and organics in the primary treatment process through gravitational sedimentation while in secondary treatment process uses microorgnisms to consume the organic matter in waste water.
5. The waste water from toilets is often referred to as black water while the waste water from kitchens and bathrooms is called grey water.
6. **Purification of water :** The process of removing pollutants from the waste water before it is discharged in a pond, river or lake or resured is called purification of water.
7. Three steps in primary treatment of sewage are :
   - The waste water is passed through parallel bag screens, which help to remove solid materials like cans, sticks, plastic bags etc.

- The water is then passed through settling tanks called grit chambers. Here, the speed of incoming waste. Water is reduced so that sand, grit, pebbles and gravel settle down which are then removed.
- Next, the waste water is passed through a sedimentation tank called a clarified tank. In this tank, the solid organic matter settle down which us then removed with a scraper. The solid organic matter that settle down is called sludge. A skimmer is used to remove floating materials like oil and grease. The water that emerges from the settling tank is called classifies water.

8. In open rainwater drains get clogged not only by all the garbage washed into them by rainwater but also by the garbage thrown into them deliberately. The logging of rain water drains is one of the causes of flooding during monsoon.
9. (a) **Biological sludge :** The residue that accumulates in sewage treatment plants is called sludge.

(b) **Water pollution :** Water pollution is the contamination of water by some harmful substance which are dangerous to human life.

(c) **Strainers :** A device having holes punched in it or made of crossed wires for separating solid matter from a liquid.

(d) **Municipal sewage :** Waste water from homes, offices and so on which in carried by sewers is called municipal sewage.

[HOTS]

Anaerobic bacteria are an important element in the waste water treatment processes. They are responsible for methane fermentation of sewage sludge facilitating decomposition of macromolecular organic matter into simpler compounds. These bacteria can be treated as microbial indicators of water pollution.

❑❑❑

CHAPTER-1
FOOD PRODUCTION AND MANAGEMENT

A. Tick (✓) the correct option :

1. (b) 2. (b) 3. (b) 4. (a)
5. (c) 6. (a) 7. (d)

B. Fill in the blanks :

1. Food 2. water supply
3. Wild, stray 4. Hay
5. Cattle 6. calcium carbonate
7. agriculture 8. Rice

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (T) 4. (F)
5. (T) 6. (F) 7. (T)

D. Write one word for the following statement :

1. Leaving land follow
2. Animal Husbandry
3. Harvesting 4. Threshing

E. Answer the following questions :

1. Horticulture is the growing and production of vegetables fruits, ornamental plants as well as management of orchards and parks.
2. During the production of refined grains, the grain is mechanically milled to remove the brain and germ portions of the seed. This process was developed in order to give the grains a fine texture and to extend their shelf life.

   Ex : maize, carrot, groundnut, jute and seasme seeds.

3. **Advantages of ploughing are :** It provides aeration and drainage. Cell in the roots need oxygen to carry out respiration and thus grow. Also, the deeper the soil is dug, the better is the drainage.
   - Loosening of soil allows the roots of penetrate deep into the soil.
   - Fertilisers mix uniformely with loosened soil.
   - Loose soil add the growth of earth worms and microbes. Some of these microbes decompose dead plants and animals, and help in recycling of nutrients.
4. Combine machine are used for harvesting and threshing.
5. - Green leaf manures are organic manures. It is essential plant nutrient to the soil and increase soil fertility in a healthy manner.
   - Manuring is done by mixing manures in the soil.
6. Differences between kharif and rabi crops are as follows :

   Kharif crops : These are sown in rainy season starting from month of June and harvested around October.

   Ex : Paddy, main, cotton and groundnut

   Rabi crops : These are sown in winter season starting from the month of October and harvested around April.

   Ex : Wheat, grain, peas, mustard.
7. Seeds are sown in two ways.

   Manual method : This method involves scattering of sees of hand. Seeds like maize, bajra are sown by this method. Seeds sown by this method are distributed unevenly in the field and also lead to wastage and reduced crop field.

   Mechanical method : In this method, seeds are sown using a seed drill. The drill makes furrows int he soil and the seeds fall into the furrow at proper depth and proper distance. Sowing seeds.
8. **Advantages of crop rotation :** To maintain the fertility of soil alternate crops should be grown. This is known as crop rotation. The crops of leguminous plants increase the fertility of soil.
9. **Define the terms :**

   (a) **Harvesting :** The cutting of crop after it is mature is called harvesting.

(b) **Hybridization :** In this process two varieties with desired characteristics are crossed, to obtain a new variety having desirable characteristics.

(c) **Transplantation :** It is the practice, of planting seedlings in main field after pulling out from the nursery.

(d) **Animal husbandry :** The science of breeding and caring for farm animals.

[HOTS]

- A horticulturist should irrigate a big fruits field by drip method.
- Nitrogen from the air is covered into soluble irons that plant roots can absorb. It forms part of nitrogen compounds in the plants, and is them passed from one organism to the next. It is returned to the atmosphere as nitrogen gas.

CHAPTER-2
MICROORGANISMS

A. Tick (✓) the correct option :

1. (a) 2. (b) 3. (b) 4. (b)
5. (a) 6. (d) 7. (a) 8. (d)

B. Fill in the blanks :

1. food, habitat 2. Vibrio
3. unicellular, multicellular
4. Griseofulvin
5. Laminaria 6. bacteria
7. Binary fission 8. bacteria

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (F) 4. (F)
5. (F) 6. (T)

D. Write one word for the following statement :

1. Microbiology 2. Pathogens
3. Pathogens 4. Lactobacillus

E. Answer the following questions :

1. Following are the two classes of micro organisms.

(i) **Free living microorganisms :** The micro organisms which live independently and reproduce by themselves, are called free living micro organisms. A large number of them in found in the natural base of organic food.

(ii) **Parasitic microorganisms :** These micro organisms cannot serving independently. They depend on other organisms for their food and habitat.

2. **Bacteria :** Bacteria are the simplest unicellular organisms. They can only be seen through a good quality microscope. Bacteria have a rigid cell wall. They do not posses a well developed nucleus.

Usefulness of Bacteria :

In medicine : Vaccines and serums are prepared by using bacteria Antibiotics like streptomycin, are obtained from bacteria.

In Industry : Lactobacillus bacteria help in the formation of milk products such as curd and cheese. Mycodermaaceti help in producing acetic acid or vinegar. Some bacteria are used in the tanning of leather.

In agriculture : Baccteria acts on dead bodies of plants and animals and convert complex organic compound into simple inorganic form.

Nitrification : Soil bacteria like azotobacter, clostridium and symbiotic bacteria ribosome are capable of fixing nitrogen from atmosphere into nitrates, which is used by green plants to produce protein.

3. There are some organisms which cannot be seen with naked eyes. These are called microorganisms.

There are five major groups of micro organisms.

Bacteria : Bacteria are the simplest unicellular organisms. They can only be seen through a good quality microscope. They have a rigid cell wall.

Fungi : They are non-green plants. They grow on rotten fruits as green-blue spots, as white green spots on stale bread kept in moist place for long.

Algae : Algae are organisms containing multicellular and filamentous or branches.

Protozoa : Protozoa have developed relatively complex subcellular features that enable them to survive the environments.

Virus : A virus is a microorganism which exhibits characteristic of living as well as non-living things. They grow and multiply inside the living things.

4. **Formation of curd :** Pour equal amount of milk in 3 beakers labelled as A, B, C. Heat the milk in beaker A to 37°C. Boil the milk in beaker B and let the milk in beaker C remain cool. Now, add a tea spoon of curd to each beaker and mix well. Cover the beakers and leave uninterrupted for 4-6 hours.

   The milk in the beaker A is set as curd. While the milk in the other two beakers is not changed into curd.

5. Usefulness of Bacteria in agriculture.
   - Bacteria acts on dead bodies of plants and animals and convert the complex organic compound into simple in organic form. Thus it helps in recycling the matter. Nitrated formed in the way increases the fertility of the soil. Soil bacteria like azotobacter, clostridium and symbiotic bacteria ribosome are capable of fixing nitrogen from atmosphere into nitrates which is used by green plants to produce proteins.

6. Viruses micro-organisms which exhibit characteristic of living as well as non living things. They grow and multiply inside the living cell of plants and animals. Harmful actions of viruses :

   Viruses cause diseases like the common old, chicken pox, cold scores, ebola and AIDS. Sometimes the virus can kill too many cells, causing the organism to suffer ill effects.

7. **Habitat of Algae :** They are aquatic by nature found in both fresh water and sea water. Algae are also called grass of water as they keep on floating on surface of stagnant water.

   Size : They may be unicellular, multicellular, and filamentous on branched.

   Structure : Algae are round, seed shaped or hook shaped. They may be unicellular, multicellular and filamentous or branched.

   Kind : Algae are of two types-unicellular algae : Chlamydomonas and diatoms are the examples of unicellular algae.

   Multicellular algae : These algae are of following kinds.

   (a) **Colonia algae :** These movable algae form colonies, which have a certain number of similar cells.

   (b) **Group :** These algae cells like Volvox are found in indefinite colonies.

   (c) **Filaments :** some multicellular algae are like filaments and can be branched or unbranched both.

8. **Structure of fungi :** Fungi are unicellular as well as multicellular. Multicellular fungi are made up of slender, thread like filaments called hyphae. The cell wall of fungi is made up of cellulose. They do not have chlorophyll.

   Kinds of Fungi :

   Moulds : These are multicellular fungi made from hyphae. These are found on stale bread, rotting fruits and vegetables.

   Mushrooms : These saprophytic fungi are large in size and are found in the tree trunks and soil.

   Yeasts : These are unicellular micro-organisms.

   Mildows : These are small sized parasites found on carrots, wheat etc.

9. Growing of amoeba and paramecium means to prepare their culture controlled conditions. For this, following procedure is followed.

   (i) **Amoeba :** Boil 100 *mL* of spring water for 10 minutes and let it cool.
   - Add eight lengths of timothy hay stalks.

   OR

   - About 10 g of pesticide-free dry grass clippings.
   - Let them stand uncovered for 24 hours.

- Transfer the mixture to shallow, stacking culture dishes.
- Add the Amoeba culture to the dishes.

(ii) **Paramecium :** Fill flask with 1L of distilled water.

- Measure out 2.5g of wheat grass powder and 3/4 of a gram of sodium phosphate and add to water.
- Bring mixture to a boil and then allow it to cool to room temperature.
- Inoculate mixture with klebsiella medium.
- Incubate inoculated mixture over night @ 37 degrees.
- Pour mixture into the large jar and add paramecium culture.
- Allow paramecium population to expand for 1-3 days.

10. Define the terms.

(a) **Fermentation :** It is the chemical break down of a substance by bacteria, yeasts or other microorganisms, typically involving effervescence and the giving off heat.

(b) **Cyst :** All micro-organisms have a hard protective covering called cyst.

(c) **Anaerobic bacteria :** Those bacteria that does not require oxygen for growth called anaerobic bacteria.

(d) **Yeast :** These are unicellular micro-organisms.

[HOTS]

1. Bacteria and fungi help to decompose organic matters and add the released nutrients to the soil. This increases the soil fertility. Without fungi and bacteria dead and decaying matters would have remained unchanged and the nutrients from those matters cannot be added to the soil. As a result soil fertility will decrease.
2. Because bacteria grows faster in summer than in winter due to the favourable conditions and as the number of bacteria increases it makes the curd sour. Lactobacillus bacteria turns milk into curd.

CHAPTER-3
MATERIALS IN EVERYDAY LIFE

A. Tick (✓) the correct option :

1. (a) 2. (c) 3. (a) 4. (c)
5. (d) 6. (d) 7. (b) 8. (a)
9. (a) 10. (d)

B. Fill in the blanks :

1. Polymer
2. easily
3. micro-organisms
4. Rayon
5. polyester
6. Reusing
7. corrosive
8. Spinneret

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (F) 4. (F)
5. (T) 6. (F) 7. (F) 8. (T)

D. Match the following :

1. (e) 2. (a) 3. (f) 4. (b)
5. (c) 6. (d)

E. Write one word for the following statement :

1. Adiplylchloride + hexamethy lene diamine
2. 24 October 1939
3. Styrene, butodiene methyl a crylate HDFE
4. Three types
   (i) Polyethylene
   (ii) Polyethylene LDPE
   (iii) Polyethylene (LLDPE)
5. Thermoplastic

F. Answer the following questions :

1. Differences between thermoplastics and thermosetting plastics are :

Thermoplastics	Thermosetting Plastics
1. They can be reshaped or remoulded as many times as possible.	1. They cannot be reshaped even on heating.
2. They become soft and get deformed on heating.	2. They do no melt or become soft one heating.
3. PVC and polythene are the examples of thermoplastics.	3. Melamine and Bakelite are the examples of thermosetting plastics.

2. Advantages of synthetic fibres over natural fibres are :

Synthetic fibres are cheap. They do not shrink, last longar than natural fibres. They dry up quickly, they need little or no ironing.

Synthetic fibres absorb very little water. They are more durable than natural fibres.

3. Polyesters are the long chain polymer of the small units generally termed as esters. The raw materials used to manufacture it comes from petroleum refineries.

Characteristics of polyester :

(a) It does not get wrinkled.
(b) It is strong and light in weight.
(c) It absorbs very little water.
(d) It dried up very quickly.
(e) It can be dyed in different colours.

4. **Characteristics of Rayon :**

(a) Rayon does not melt at high temperature. It loses strength at 149°C.
(b) Rayon exhibits poor crease recovery and crease retention.
(c) Acids and bleach degrade rayon while bases have no effect on it.
(d) If exposed to sunlight for a long time, the strength of the rayon fibres decreases due to the degradation of the cellulose chain.

Used of Rayon : Rayon fibres are used for the following purposes.

(a) Blended with wool, rayon is used in the manufacture of carpets.
(b) Gauze for bandages and lint for the dressing of wounds are made of rayon.
(c) Manufacture of apparels like suits, neckties, jackets undergarments.
(d) Tyre cord is made from rayon.

5. **Hazards of plastic :**

(a) Dumping plastics in water bodies poses a threat to aquatic life.
(b) Burning plastics release toxic gases which cause air pollution. Thus, it may result in various health hazards.
(c) Plastic bags thrown in garbage, with food in them are sometimes consumed by animals like cows.
This may choke their respiratory system and lead to death of animals.
(d) Use of recycled plastic bags to keep food items in them is also harmful for health.

6. **Synthesis of synthetic fibres :** Synthetic fibres are created by extruding fibre forming materials through spinnerets, forming a fibre. Synthetic fibres are created by a process known as polymerization which involves combining monomers to make a long chain or polymer.

7. **Uses of Nylon :**

(a) It is a good packaging material.
(b) Nylon is used for making fishing nets, tyre cords, climbing ropes, parachute fabrics and bristles of brushes.

Uses of Rayon :

(a) Tyre cord is made from Rayon.
(b) Cause of bandages and lint for the dressing of wounds are made of rayon.

[HOTS]

1. We should avoid plastics as far as possible because plastic takes several years to decompose. It is not environment friendly. It cause environmental pollution.
2. Plastic containers are favoured for storing food because plastic do not react with water and air. They are not corroded easily while metal container which are made from iron on steel get rusted when left exposed to moisture and air. That is why plastics containers are favoured for storing foods.
3. Cotton is a plant product and paper is also made from plants. So when cotton is burnt, it smells like burning paper. While wool and hair both are from animals, hence on burning they smell similar.

CHAPTER-4
METALS AND NON-METALS

A. Tick (✓) the correct option :

1. (d) 2. (b) 3. (a) 4. (c)
5. (a) 6. (c) 7. (b) 8. (d)
9. (a)

B. Fill in the blanks :

1. heat, electricity 2. Non-metals

3. good 4. Zinc
5. crust

C. Complete the following equations :

1. $2MgO$ 2. $2AlCl_3 + 3H_2$
3. $MgSO_4 + Cu$ 4. $FeSO_4 + Cu$
5. H_2SO_3 6. $2NaOH + H_2$

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (c) 2. (f) 3. (a) 4. (e)
5. (b) 6. (g) 7. (d)

G. Give reason why :

1. Gold is present at the bottom of the reactivity series of metals. Gold is non-reactive metal that does not react with water, acids and alkalies while iron is react with water, acids and alkalies rapidly. That is why cold found in free state but iron is not.
2. Sodium metal is very reactive with cold water while iron reacts with water slowly. Sodium reacts vigorously with oxygen and water. A lot of heat is generated in the reaction.
3. Because iron is more reactive than copper and copper is less reactive and a less reactive element cannot displace a more reactive element.
4. It is used because of its exceptional malleability and resistance to corrosion. Silver is used to its superior conductivity compared to copper. Silver does corrode but even the corrosion product is a much better.
5. Utensils are made up of metals like steel, copper aluminium because they are good conductors of heat so it is easy to cook food in it. The handle is made of wood as they are insulators and will not become hot.
6. Sodium metal is very reactive. It reacts vigorously with oxygen and water. A lot of heat is generated in the reaction. It is, therefore stored in kerosene.
7. White phosphorous is a very reactive non-metal. It catches fire if expored to air. To prevent the contact of phosphorous with atmospheric oxygen. It is stored in water.

G. Answer the following questions :

1. Physical properties of metals :
   (a) **Rigidity :** Metals are rigid. Metals like iron, copper, aluminum are more rigid while sodium and potassium are soft metals.
   (b) **Lustre :** Metals generally posses lustre. It is the property of metals by virtue of which they shine.
   (c) **Malleability :** Metals can be hammered or beaten into thin sheets without breaking. It is called malleability.
   (d) **Ductility :** The property of a metal to be drawn into thin wires is called ductility.
   (e) **Conductivity :** Metals are good conductors of heat. This property of met also make them suitable to be used in cooking utensils, heating elements.
   (f) **Colour :** Generally metals are grey in colour.
   (g) **Tensile strength :** Some of the metals are very strong. Metals can be stretched to a limit with breaking.
   (h) **Sonorous :** Generally metals are sonorous, that is they produce sound when struck. So they are used to make bells.
   (i) **Melting point and boiling point :** Generally metals have high melting points and boiling points.
2. Noble metals are those metals which are present at the bottom of the reactivity series. They are non reactive and do not react with water, acids and alkalies. They occur in a free state in nature.
   Noble metals are used in making ornament because non-reactive. The ornaments made from noble metals do not loss their shine.
3. **Uses of Metals :**
   (a) Articles such as nails, bolts, chains, wire nets, agricultural tools etc. are made by wrought iron.

(b) Steel is used in construction of building ships, railway lines utensils and knives.

(c) Aluminum is used to make cooking utensils.

Uses of Non metals :

(a) Phosphorus is used in making matchboxes and in fire works industry.

(b) Graphite is used to make the lead of pencils.

(c) Silicon is used in making transistors, microchips used in computers.

4. **Metalloids :** Those substances which possess character of both metal and non-metals are called metalloids.

   Example : Boron, silicon, germanium, arsenic, antimony, tellurium and polonium are example of metalloids. Metalloids tend to be semiconductors. Silicon is the best known example of a semiconductor.

5. The purity of gold is measured in carat. 24 carat gold is considered 100% pure gold. 22 carat gold has 95% pure gold and 8% impurities. In the 18 carat gold, 75% pure gold and 25% impurities are mixed.

6. **Corrosion :** The layer by layer decay of metal is called corrosion, so oxidation of metals under normal atmospheric condition is called corrosion.

   Prevention of corrosion : Prevention method are as follows :

   (a) **Painting :** Covering the surface metal with paint is the best way to check corrosion.

   (b) **Greasing :** The layer of oil or greases cuts off the metals contact with the air and moisture.

   (c) **Anoding :** This is the process of electro plating with sulphuric acid is used as the electrolyte.

   (d) **Electroplating :** Iron and steel are made corrosion free by coating them with a layer of Tin or chromium.

   (e) **Zinc plating :** Another method of saving iron from rusting in zinc plating.

7. Differences between the chemical properties of metals and non-metals are :

Metals	Non-Metals
1. Metals react with water to form hydro oxides.	1. Non-metals do not react with water.
2. Metals react with acids to produce metallic salts and hydrogen gas.	2. Non metals do not react with acids.
3. Metals react with oxygen to form oxides which are basic in nature.	3. Non-metals react with oxygen to from non-metal oxides which are acidic or neutral.

8. **Define the terms :**

   (a) **Corrosion :** Oxidation of metals under normal atmospheric condition is called corrosion.

   (b) **Ductility :** The property of metal to be drawn into thin wire is called ductility.

   (c) **Electroplating :** It is the process by which iron and steel are made corrosion free by coating them with a layer of tin or chromium.

   (d) **Malleability :** Metals can be hammered or beaten into thin sheets without breaking. This property of metals is called malleability.

[HOTS]

1. Sodium metal is very reactive it reacts vigorously with oxygen and water. A lot of heat is generated in the reaction. It is, therefore, stored in kerosene while phosphorous is very reactive non-metal. It catches fire if exposed to air. To prevent the contact of phosphorous with atmospheric oxygen it is stored in water.

2. Pickles are sour substances that contain organic acids which are weak acids in them. These acids will react with the metallic part of the vessels to form salts. These salts are poisonous and hence dangerous to our health.

3. Because metals are good in making sound that means they have the property of sonority which allows them to produce good quality sound. For this reason, metal are used to make strings of musical instruments.

CHAPTER-5
COMBUSTION AND FLAME

A. Tick (✓) the correct option :

1. (b) 2. (b) 3. (b) 4. (b)
5. (d) 6. (a) 7. (a) 8. (c)

B. Fill in the blanks :

1. Combustion
2. Sodium, potassium
3. ignition temperature
4. extraction
5. Nitrogen
6. heat, light
7. outer most
8. Carbon mono oxide

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (T) 4. (T)
5. (T) 6. (T) 7. (T) 8. (F)
9. (F) 10. (T)

D. Give reason for the following :

1. Carbondioxide is used to extinguish electrical fire because carbondioxide gas is not a supporter of combustion.
2. If the clothes of a person catch fire, he is asked to roll on the floor or is covered with a thick blanket because fire blanket completely surrounds the person. Woollen blanket cuts off the oxygen supply to the fire thereby putting it out. Hence the woollen blanket act as a fire extinguisher to the person.
3. Sodium is kept under kerosene oil because it reacts vigorously with oxygen and water. A lot of heat is generated in the reaction.
4. Paper is a combustible substance, but not a fuel because it cannot be a fuel as it cannot produce high calorific value on burning.
5. Fire caused by petrol cannot be extinguished by water because water is heavier than petrol. So it sinks below the oil, and petrol keeps burning on the top.
6. CNG is preferred over petrol as a fuel because it produces harmless gases as compared to petrol to the environment.

E. Answer the following questions :

1. **Combustion :** It is a process in which a substance burns in air or oxygen to produce heat and light.
2. The three conditions necessary combustion to occur are :
   (i) A combustible substance
   (ii) Presence of air or oxygen
   (iii) Ignition temperature
3. Combustion of fuels releases carbon dioxide. An increase in the concentration of carbon dioxide in the atmosphere leads to an increase in the temperature of the Earth as carbon dioxide is a green house gas. Carbon dioxide gas causes global warming which is leading to melting of polar ice caps. As a result, there is a rise in the level of water in seas and oceans leading to flooding of coastal regions.
4. **Different zones of candle flame :** There are three zones of a candle flame.
   (i) **The outermost zone :** This part of the flame is invisible. Here the combustion is completed as carbon changes into carbon dioxide.
   (ii) **Middle or Luminous zone :** It is the most visible part of the candle flame. This zone is yellow in colour, opaque and luminous.
   (iii) **Innermost or Non-luminous zone :** It is the inner most zone and a very small amount of oxygen is present there. It is also the coldest part of the candle.
5. **Difference between combustible or non combustible substances are :** Substances which burn in air to produce heat and light are called combustible substances which the substances in which no combustion takes place are called non-combustible substances i.e. substances like stone, glass, iron nails etc. do not burn on being exposed to flame.
6. Fuel is any substance that burns to produce heat and light energy.

Characteristics of a good fuel :

(i) It leaves no residue after burning.

(ii) It causes minimum pollution.

(iii) It should have moderated rate of burning.

(iv) It should be cheap and easily available.

(v) It should have a high calorific value.

(vi) It is easy to store, transport and handle.

(vii) It should have low ignition temperature.

7. A fire extinguisher is a portable device that dischanges a jet of water, foam, gas or other material to extinguish a fire.
8. Fire may be extinguished by following these steps :
   - Combustible substance should be quickly removed from the area to prevent the further spreading of fire.
   - Bringing the temperature of the substance below its ignition temperature. This is done by cooling the substance mainly by using water.
   - The supply of supporter of combustion that is air should be cut off. This can be done by increasing the concentration of non-supporter of fire.
   - Cutting of the supply of air.
   - Cooling the burning substance below its ignition temperature.
   - Remove all combustible substances.
9. The ignition temperature is the temperature at or above which a substance starts burning.
10. Fire extinguishers are filled with carbon dioxide gas under extreme pressure. The pressure in the cyclinder is so high that when use, bits of dry ice come out of the nozzle. Carbon dioxide is not conductive in nature these can also be use to put out electrical fires.
11. Difference between complete and incomplete combustion are : If there is enough oxygen to support combustion or burning process, the combustion is called complete combustion.

    $Fuel + O_2 \rightarrow CO_2 + H_2O + Heat\ and\ light$

    If there is insufficient oxygen to support combustion or burning process the combustion is called incomplete combustion.

    $Fuel + O_2 \rightarrow CO + H_2O + Heat\ and\ light$

12. **Define the terms :**
    (a) **Ignition temperature :** The lowest temperature at which a substance starts burning is called its ignition temperature.

    (b) **Calorific value :** The efficiency of a fuel is mainly decided by the amount of heat it releases on complete combustion of its one kg of fuel. This is known as calorific value of the fuel.

    (c) **Explosion :** An explosion is a rapid increase in volume and release of energy in an extreme manner, usually with the generation of high temperatures and the release of gases.

    (d) **Combustion :** A process is which a substance burns in air or oxygen to produce heat and light.

[HOTS]

1. Green leaves contain moisture whereas dry leaves do not contain moisture as a result, the ignition temperature slow and they catch fire easily.
2. A matchstick does not catch five and burn on its own at room temperature because the ignition temperature because the ignition temperature of matchstick is higher than the room temperature. A matchstick starts burning on rubbing it on the side of the matchbox because the heat produced by friction heat the chemical at the head of the matchstick.

CHAPTER-6
CONSERVATION OF PLANTS AND ANIMALS

A. Tick (✓) the correct option :

1. (b) 2. (a) 3. (d) 4. (b)
5. (a) 6. (c) 7. (a) 8. (a)
9. (b)

B. Fill in the blanks :

1. Conservation 2. conserved
3. flora, fauna 4. Deforesting
5. Biosphere reserve

C. Write 'T' for True and 'F' for False :

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

D. Write one word for the following :

1. Biosphere reserve
2. Resource depletion
3. Threatened species
4. Migration

E. Answer the following questions :

1. To make such an arrangement which will ensure the continuous development and survival of the wildlife is known as wildlife conservation.

   These objectives of conservation are :

   - To maintain the essential ecological processes and the life support system such as air, water, land flora and fauna. These life support systems are interconnected, interdependent and interrelated. Hence, the deterioration of one will affect the rest of the other elements of life support system.
   - To ensure the proper and planned utilization of natural resources so that these are continuously available for utilization.
   - To preserve biological diversity.

2. Endemic species are plants and animals that are found exclusively in a particular geographical area.

   Example : Sal and wild mango are two examples of the endemic flora while Bison, Indian gaint squrrels and flying squirrels are some of the endemic species.

3. **Different threats to biodiversity :** The main dangers world wide are population growth and resource consumption, climate change and global warming habitat conversion and urbanization, over exploitation of natural resources and environmental degradation.

4. **Causes of extinction of wildlife :** Extinctions are occurred because species were unable to adapat quickly enough to a naturally changing environment. Today, most extinctions take place due to human activity. Many of the species, such as dodo of Mauritius became extinct because of hunting while many other became extinct when their habitat was destroyed.

5. The advantage of recycling paper include saving energy, water and landfill space. Paper recycling reduces green house gas emissions and the recycled fiber is a sustainable, cost saving resource for making new paper products.

6. **Causes of deforestation :** The cause of deforestation are

   Man made causes : Human being are felling trees for

   (i) Procuring land for cultivation of crops, vegetables and fruits and for building houses, factories, rocids.
   (ii) Clearing land for mining.
   (iii) Cutting tress for making furniture and for obtaining firewood.

   Natural causes : Some natural causes of deforestation are

   (i) forest fires
   (ii) severe droughts
   (iii) Floods, earthquakes and landslides.
   (iv) Pests and viral and fungal diseases of plants.

   Consequences of Deforestation : One of the consequences of deforestation is a loss of biodiversity. Deforestation also increases green house gas emissions, disrupts the water cycle, increase soil erosion and decreases the natural beauty of an area.

7. **Define the terms :**

   (a) **Ecosystem :** A community of interacting and interdependent organisms and the physical environment.

   (b) **Endemic species :** Plants and animals that are found exclusively in a particular geographical area.

(c) **Endangered species :** The species that are at high risk of becoming extinct.

(d) **Migration :** The seasonal mass movement of animals from one place to another to escape from extreme cold, due to shortage of food or to breed.

[HOTS]

1. No, real dinosaurs were not used to make the movie Jurassic park because they do not exist. They lived on Earth millions of years ago but became extinct due to natural cause. In order to recreate the old reptiles in the movie computer graphics were used extensively.
2. Our life would not exist on earth without trees because they produce most of the oxygen that humans and wildlife breathe. There would also be no rain without trees since trees absorb water from the soil and release it through evaporation.

CHAPTER-7
CELL ORGANIZATION

A. Tick (✓) the correct option :

1. (a) 2. (b) 3. (c) 4. (c)
5. (b) 6. (b) 7. (c) 8. (d)
9. (d) 10. (b)

B. Fill in the blanks :

1. cell 2. protoplasm
3. Endoplasmic reticulum 4. vacuoles
5. life 6. Robert Hook
7. cytoplasm 8. Nerve cell
9. membrane 10. plant

C. Write 'T' for True and 'F' for False :

1. (T) 2. (F) 3. (T) 4. (T)
5. (T) 6. (T) 7. (F) 8. (T)

D. Match the following :

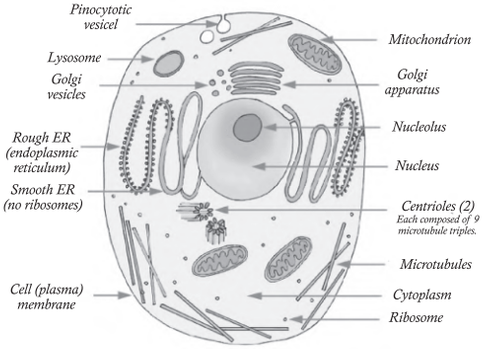
1. (f) 2. (e) 3. (d) 4. (c)
5. (b) 6. (a) 7. (g)

E. Give one word for the following :

1. Cell wall 2. Nucleus
3. Chromoplasts 4. Tissue
5. Cell membrane 6. Nucleus

E. Answer the following questions :

1. **The cell :** Cell is the structural and functional unit of life. Cells were discovered by Robert Hooke in 1665.
2. **Function of Mitochondria :** They produce energy by the oxidation of digested food in the presence of oxygen. So these are known as power house of the cell. Mitochondria is the site of cellular respiration and oxidation of food.
3. Cell membrane is the protective covering of plants and animals cell. Cell membrane provides shape and support to the cell. It controls the movement of particles in and out of the cell.
4. **Animal cell structure :** Animals cells are typical of the eukaryotic cell enclosed by a plasma membrane and organelles. Unlike the eukaryotic cells of plants and fungi animal cells do not have a cell wall.



5. Nucleus is the central structure of the cell and is called the brain of the cell. It is also called the control centre of the cell.

   The nucleus centrols all metabolic activities of the cell. In its absence the cell is almost dead. The nucleus controls cell division, synthesis of protein and storage. It also provides genetic information.
6. Difference between animal cell and the plant cell are :

Cell components	Animal Cell	Plant cell
1. Cell wall	Absent	Present
2. Cell mem brane	Present	Present
3. Plastids	Absent	Present
4. Vacuoles	small	Large
5. Nucleus	Present	Present
6. Mitoction dria	Present	Present

7. Unicellular division in amoeba. In unicellular organisms like amoeba only one cell grows in size after digesting food.

   After attaining certain size, it is divided into two equal part. These cells are called daughter cells and these are identical to the mother cell. In amoeba, the mother cells grows in size. first the nucleus is divided into two by taking the shape of a dumb-bell. It forms daughter nuclei.

8. Plastid are found in plant cells and are of different types. Plastid not having chlorophyll are called leucoplasts. Plastid are large organelles which can be seen in plants cells and can be separated also.

9. **Define the terms :**

   (a) **Plastids :** Plastids are large organelles which can be seen in plants cells. They are the site of photosynthesis.

   (b) **Vacuoles :** Sack like empty space in the cell is called vacuoles.

   (c) **Nucleus :** It is the control centre of the cell.

   (d) **Mitochondria :** It is the powerhouse of the cell.

10. Robert Hook saw many boxlike structures huddled together and separated by partitions. These box like structures were actually dead cells. They appeared like a honey comb.

11. Cell multiply by a process called mirrors. The cell cycle consists of a series of stage, including interface, mitosis and cytokinesis in which the tell grows and divides to produce two daughter cells. Finally, during telophase, chroma somes being to unwrap itself.

[HOTS]

1. Plants cells have cell wall because plant do not move from one place to another and hence they, require rigidity which is provided by the cell wall but animal cells move. They cell wall if present in the animal cell will be hinderance to movement.

2. Chromosomes enclosed with the number of the genes so it carries along with the hereditary characteristics from the respective parents to the child. Hence it is called as the heredity vehicles.

CHAPTER-8
REPRODUCTION

A. Tick (✓) the correct option :

1. (a) 2. (a) 3. (a) 4. (c)
5. (d) 6. (c) 7. (a) 8. (d)
9. (c) 10. (a)

B. Fill in the blanks :

1. population 2. Hormones
3. sexual 4. Fertilisation
5. Umbilical cord 6. female
7. 4–6 8. gametes

C. Write 'T' for True and 'F' for False :

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

D. Write one word for the following statements:

1. Testes 2. Reproduction
3. uterus 4. Fertilization

E. Answer the following questions :

1. Reproduction is helpful to living beings in:
   (i) the continuity of life.
   (ii) increasing the population of any species.
   (iii) the evolution of the most favorable variation over a period to time.

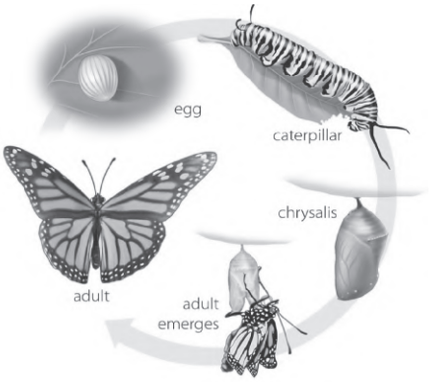
2. The major glands of the endocrine system are as follows :
   (i) Pituitary (ii) Adrenal
   (iii) Thyroid (iv) Pancreas
   (v) Testes (vi) Ovaries

3. The process of ovulation thickening of the uterine wall and menstrual cycle which lasts 28-day cycle is called mensuration.

4. The human male reproductive system consists of a pair of testes, two sperm ducts and a penis. The testes produce the male gametes known as sperms. Millions of sperms are produced in the testes. Sperms are very small in size. It has a head, a middle

piece and a tail. It is a single cell with all the usual cell components.

5. **Life cycle of Butterfly :** A butterfly lays eggs on or on the underside of leaves. The eggs hatch into caterpillars or larval. After feeding for some day, a caterpillar becomes immobile. It body shortens and get enclosed in a hard case called cocoon. A this stage is called a pupa. The pupa sheds it skin several times by the process known as moulting. It undergoes changes and transforms into an adult butterfly. The entire process which starts with the formation of eggs and goes on till the formation of butterfly, repeats itself.



6. Reproduction is one of the fundamental attributes of a living organism through which it is able to produce more of own kind. Reproduction is of two types.
   (i) Asexual reproduction
   (ii) Sexual reproduction
7. **Difference between internal fertilization and external fertilization are :** It same animals like fish and frogs, fertilization takes place outside the body. This is called external fertilization. The females discharge many eggs into the water and the males discharge sperms close to the eggs. The sperms swim to the eggs and fertilize them. In higher animals, like lizards, crocodile, birds and mammals, fertilisation takes place inside the female's body. This is called internal fertilization.
8. The sex of a child is solely dependent on his/her father. When an egg is fertilized by the sperm carrying the X chromosomes i.e. X chromosomes of mother and X chromosomes of father the new born baby is a girl. On the other hand, if the sperm carrying the y-chromosomes fertilizes the egg. i.e. X chromosomes of the mother and Y chromosomes of the father, the new born baby is a body.

[HOTS]

1. Because as they do not look after their young most do not survive to adulthood. Frogs laid so many eggs in water to make sure that enough eggs reach to the morality & adulthood.
2. No, cloning cannot be done without a female because the embryo develops inside the female body. In cloning the nucleus of a host cell is trans planted into enucleated female egg cell. The fused cells are them transferred into the uterus of female where further development takes place.

CHAPTER-9
FORCE AND PRESSURE

A. Tick (✓) the correct option :

1. (a) 2. (d) 3. (c) 4. (d)
5. (a) 6. (b) 7. (a) 8. (c)

B. Fill in the blanks :

1. force 2. muscular
3. Friction 4. same
5. Atmosphere pressure 6. less
7. more 8. less

C. Write 'T' for True and 'F' for False :

1. (T) 2. (T) 3. (F) 4. (F)
5. (T) 6. (F)

D. Match the following :

1. (d) 2. (a) 3. (b) 4. (e)
5. (c)

E. Write one word for the following :

1. Magnetic force 2. Contact force
3. Force 4. Atmosphere

F. Answer the following questions :

1. **Force :** A push or pull on an object is called force.

   Effect of force : Force has different effects on a body. It depends upon the types of the force applied, and reason for application of the force.

Force can cause movement. It can change speed. It can change shape and size of an object. It can change direction of motion.

2. **By oiling :** Oil forms a thin layer between the two surfaces and the moving surfaces do not directly sub each other. Thus, the movement becomes smooth.

   Ball bearings reduce friction by converting, sliding friction into rolling friction. This helps to reduce friction between the two surfaces in contact and also helps to save energy.

3. Three types of non-contact forces are :
   (i) Gravitational force
   (ii) Magnetic force
   (iii) Electrostatic force

4. It is because when the object is at rest, static friction occurs. The static friction is maximum when the applied force is just short of the force required to start motion between the two bodies in contact once the objects starts moving, friction (resistance) decreases.

5. **Advantages of friction :**
   (i) Without friction we cannot write walk and transmit energy from one place to the other. We could not write with pen or pencil, if there were no friction.
   (ii) Friction is responsible for starting or stopping motion. Had there been no friction between the tyres of the automobiles and the road, they could not be started or stopped or turned to change the direction of motion. Thus friction is necessary.

   Disadvantages of Friction : It is a non-conservation force. Therefore energy is always lost in overcoming friction. This loss in energy is in terms of heat and sound energy. Friction produces heat. When you vigorously rub your palms together for few minutes, they become hot.
   - It is responsible for wear and tear of various part of machines. It also wear our material like screws ball bearing or soles of shoes.
   - Friction decreases the efficiency of machines as a part of the machines energy is lost in overcoming friction. Thus, friction is an evil.

6. **Mechanical force :** The force produced or exerted by a machine is called mechanical force. Use of mechanical force :
   - A car, truck, train and aircraft move by mechanical force.
   - Mechanical force is needed to turn wheels or to push air behind it.

7. We can change the speed and moving direction of body by applying force on that moving object.

8. A streamlined body is a shape of body that reduces resistance when moving.

   Some animals such as sharks and dolphins, are streamlines so that they have less resistance when swimming in water. This same idea works with airplanes! when things are flats, they have more fraction drag. When airplanes fly they rub against air particles. This slows them down. To help. lesson this drag we make airplanes streamlined. This way air can move around airplanes quickly and come together smoothly on the other side.

9. **Define the terms :**
   (a) **Friction :** Friction is the force resisting the relative motion of solid surfaces, fluid layers and material elements sliding against each other.
   (b) **Magnetic force :** Force exerted by a magnet on certain metals such as iron is called magnetic force.
   (c) **Gravitational force :** A pulling force exerted by two object on each other.
   (d) **Atmospheric pressure :** The pressure exerted by the weight of the atmosphere on an object.

10. The amount of force acting per unit area of an object is called pressure.

    Pascal is the SI unit of pressure.

[HOTS]

1. The football shoes have spikes because the spikes provides larger frictional force than normal shoes while running on the grass.
2. Two finite masses do not come closer if gravitational force exist between them a finite mass exert the force of gravity but there exists a force of attraction between two finite masses.

CHAPTER-10
SOUND

A. Tick (✓) the correct option :

1. (d) 2. (a) 3. (d) 4. (a)
5. (c) 6. (a) 7. (d) 8. (b)

B. Fill in the blanks :

1. Sound 2. decibel (dB)
3. larger 4. Noise
5. Hammer, anvil, stirrup 6. 17 m

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (c) 2. (d) 3. (b) 4. (e) 5. (a)

E. Answer the following questions :

1. Sound is a kind of sensation received by our ears and perceived by our brain. It is a form of energy.
2. Echoes are reflected sounds.

   We do not hear ecotioes all the times because we can distinguish two sounds only there is a time lapse of one-fifteenth of a second between them. In other words, we can hear the echo of sound only if it takes one tenth of a second to hit the reflecting surface and come back.
3. The difference between loudness and pitch are :

Loudness	Pitch
1. It depends on the amplitude of a liberating body.	1. It depends on the frequency of a vibrating body.
2. It does not change with frequency.	2. It changes with frequency.
3. It is determined by teh amount of sound energy received by the ear in unit time.	3. It does not depend upon the amount of energy received by the ear.

4. The sound produced by a vibrating body is a form of energy. The vibrating body transfers this energy to the surrounding air molecules which then start vibrating with the same frequency. These molecules pass on the vibration to the neighbouring molecules and so on. This is how sound travels in air. Sound travels faster through solids than through air because molecules of solid are packed closer than those in air. Since molecules carry the vibrations they do so more efficiently when they are close together.
5. Some unpleasant sounds are called noise. Thus noise is an unpleasant sound that often produces an irritating effect on us while we enjoy sound of musical instruments. Musical sound is one which is pleasing to ear.
6. Doctors and other health experts tell us that noise is a health hazard for all of us. It makes us easily irritable and adds to our level of mental tension. Due to noise pollution lack of sleep, hypertnsion, anxiety, increased in blood pressure, increased heart beat and muscular contractions take place in our body.

   Sources of noise pollution are :

   (i) Sounds of vehicles.

   (ii) Explosions including bursting of crackers, machines and louds packers.
7. It is because light travel much faster than sound hence, flash of light of thunder reaches almost instantly, whereas sound of thunder take time to reach us. Loudness of sound determines the distance it can travel before.
8. In percussion instrument pitch is determined by stretching its leather membrane and loudness. It is increased by striking the membrane harder.
9. In our ear the pinna collects sound waves from the surroudings in and sends them to the eardrum. These sound waves strike the eardrum and vibrate it.

The vibrations are passed into the three bones in the middle ear that amplify the vibrations. The amplified vibrations are received by the cochlea which converts them into nerve impulses that are sent to the brain through the auditory nerve. They brain decodes the nerve impulses and get the specific information.

10. **Pitch of sound :** Pitch of sound is the shrillness of sound. It helps in distinguishing a shrill sound from a grave or hoarse sound.

11. **Define the terms :**

(a) **Vibration :** The rapid back and forth movement of a body about its mean position is called vibration.

(b) **Frequency :** The number of oscillations made by a vibrating body in one second is called frequency.

(c) **Echocardiography :** In echocardiography ultrasonic vibrations are reflected by different part of an organ help to create an image of the organ. This teach nique is used in case of the heart.

(d) **Noise pollution :** Some unwanted sound in environment which is caused pollution in environment is called noise pollution.

(e) **Sound loudness :** It is determined by the amount of sound energy received by the ear in unit time.

[HOTS]

1. This is because the vibrations produced by our sound can cause the snow to fall and cause avalanche.
2. Because speech is developed by learning during the course of development. Similarly kids develops speech by hearing people around him/her. Hearing loss hundered this process and hence speech might be defective.

CHAPTER-11
MAGNETISM AND ELECTRICITY

A. Tick (✓) the correct option :

1. (a) 2. (d) 3. (b) 4. (a)
5. (a) 6. (c) 7. (d) 8. (a)
9. (a) 10. (b)

B. Fill in the blanks :

1. Natural 2. North-South
3. magnetic field 4. G. Leclanche, 1866
5. insulation 6. Electric bulb
7. Fuse

C. Write 'T' for True and 'F' for False :

1. (T) 2. (F) 3. (T) 4. (T)
5. (T) 6. (T)

D. Match the following :

1. (b) 2. (a) 3. (d) 4. (f)
5. (c)

E. Write one word for the following :

1. A.C. and D.C.
2. Demagnetization
3. Electric current
4. Power Battery on Dynamo

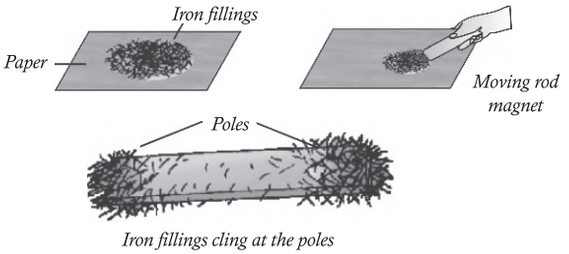
E. Answer the following questions :

1. Magnets were probably discovered by Greeks. A shepherd whose name was magnet would to take his sheep to the nearby mountains for grazing one day he discovered that the end to stick with the iron tip would get attracted to a rock. On further investigation, the Greeks found that the rock had the property of attracting iron. They named the rock magnetite after magnes.

2. (a) Bring another magnet near the magnet and the iron rod respectively. The rod whose both the end are attracted to word the magnet. i.e. iron rod.

(b) The rod whose only one end gets attracted by the magnet and other end is repelled, is a magnet. This repulsion made the magnet distinguishable, not the attraction.

3. Take a magnet and suspend it freely as shown in figure.

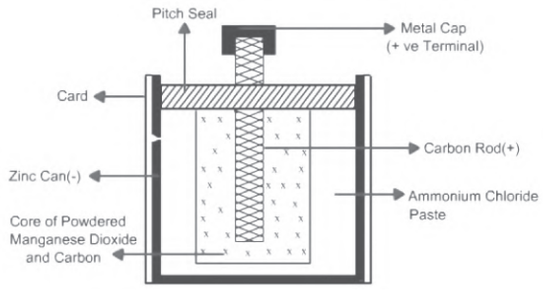


Iron fillings cling at the poles

Let it come to rest. You find that it always comes to the rest in north south direction. To study the north and south poles of a magnet. We can take the help of other activity. Spread a clean sheet of white paper or table. Put some iron fillings on the sheet. Now, move a magnet 2-3 times over the fillings. The filings cling to the magnet. Most of the fillings cling near the poles because, the magnetic force in greatest near the poles. Every magnet has north and south. i.e. two poles.

4. There are two different types of current. They are direct current or DC and alternating currenty.
   (i) **Direct current or D.C. :** The electric current flowing continuously in a direction is called direct current. It flows from positive (+) to negative (–) terminal. The closed circuit connected with battery cell is the main example of D.C.
   (ii) **Alternating current (A.C.) :** The electric current flowing freely and changing its direction quickly, whose poles alternately becomes positive and negative is called alternating current or A.C. The current which flows in the domestic circuit and completes 50 cycles per second is A.C.
5. Two methods of making a magnet are :
   (i) **Single touch method :** Keep a bar of steel or iron on a table. Now, rub the north pole of a powerful bar magnet with the bar for 30-40 times slowly.
   (ii) **Double touch method :** Keep the bar to be made a magnet, on a table. Take two bar magnets, on a table. Take two bar magnets and keep their opposite poles, in the center of the bar. Move the magnets in the opposite direction on the bar, for 30-40 times. Test, if the bar has become a magnet.
6. The flow of electric charge is called electric current. The flow of electric current is like the flow of water in a pipe from a higher level to the lower leave. Electric charge can be stored, as well as, transferred from a place to the other place.
7. The phenomenon by which magnetic substances acquire magnetic properties temporarily due to the presence of another magnet near it, is called magnetic induction.
   Method of making magnets : There are two methods of making a magnet.
   (i) **Single Touch method :** Keep a bar of steel or iron on a table. Now, rub the north pole of a powerful bar magnet, with the bar for 30-40 times slowly.
   (ii) **Double touch method :** Keep the bar to be made a magnet, on a tables. Take two bar magnets and keep their opposite poles, in the centre of the bar. Move the magnets in the opposite direction on the bar for 30-40 times. Test, if the bar has become a magnet.
8. Methods of demagnetization are
   (a) By beating the magnet with a hammer.
   (b) By dropping the magnet on the Earth, again and again.
   (c) By heating the magnet.
   (d) By using the magnet in an improper way.
9. **Electric fuse :** An electric fuse is a safety device which works on principle of heating effect of current.
   Uses : It breaks the electric circuit if there is an excessive flow of current in the circuit. the prevents a possible electric fire and prevents damage to the electric appliance used.

10. **Construction of Dry cell :** It this cell, cylindrical container of zinc, make the negative electrode. Paste of ammonium chloride acts as the electrolyte. Positive electrode is carbon rod, kept in the past and the mixture of MNO_2 and graphite.



There is a brass cap on the carbon rod. zinc can be insulated by a piece of cardboard. A thick layer of pitch makes the cell insulated at th top.

Function of Dry cell : On connecting the positive and negative terminals of the cell with a wire, an electric current of 1.5 volt starts flowing

11. Difference between the temporary and permanent magnets are :

Temporary Magnet	Permanent Magnet
1. When a magnet loses its magnetic properties on removing the permanent magnet is called a temporary magnet.	1. The magnet which does not lose its properties is called a permanent magnets.
2. The minute magnets present in the magnet are disaligned and loose their magnetism.	2. The minute magnets inside the magnet are permanently aligned.
3. A temporary magnent cannot convert a piece of iron into a magnet as it is less powerful.	3. A permanent magnet can convert an ordinary piece of iron a temporary magnet.

12. One application of magnetic and chemical effects of electric currents are :

Magnetic effects of electric current :

(a) An electric bell works on the principle of electromagnetic effects of electric current.

(b) **Chemical effects of electric current :** Electroplating the process of depositing a layer of any desired metal on another material by means of electricity. It is one of the most common application of chemical effects of electric current.

13. Define the following terms :

(a) **Magnetism :** Magnetism is the property of a material by which it attracts iron or steel.

(b) **Direct current** : The electric current flowing continuously, in a direction is called direct current.

(c) **Electrolysis :** When icons are separated is a solution, by passing electric current, it is called electrolysis.

(d) **Storage Battery :** In this cell, the current produced by the chemical reaction can be reversed. In this way, the chemical can be obtained and cell can again produce current.

(e) **Electromagnet :** A piece of soft iron with insulated wires wound around it, that behaves like a magnet when electric current flows through the wire.

(f) **Magnetic field :** A magnet attracts, piece of iron from a distance. There is field around the magnet, where it, affect can be see. This effective field around the magnet, is called the magnetic field.

[HOTS]

1. This is because water is a good conductor of electricity and if it is throw, person may get an electric shock which may lead to his death.
2. Pure water can be made conducting by dissolving salt in it.

CHAPTER-12

SOME NATURAL PHENOMENON

A. Tick (✓) the correct option :

1. (d) 2. (a) 3. (b) 4. (d)
5. (c) 6. (a) 7. (b)

B. Fill in the blanks :

1. Benjamin Franklin

2. Positive, Negative 3. lightning
4. earthquake 5. core

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (d) 2. (a) 3. (e) 4. (c)
5. (b)

E. Write one word for the following :

1. Mantle 2. Seismograph
3. Lightning conductor 4. Earth quake

F. Answer the following questions :

1. If a neutral object is rubbed with a cloth and it gains electrons, then it becomes negatively charged. It a neutral object is rubbed with a cloth and it loses electrons, then it becomes positively charged.

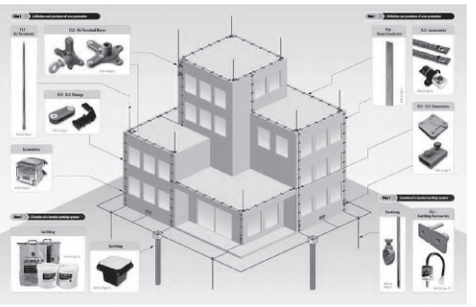
   A neutral object which gains electrons is said to have an excess of electrons.

2. Precautions that we should take a protect ourselves from lightning are :
   (i) Keep distance from vulnerable locations like isolated trees or isolated tall structures.
   (ii) A lightning protection system ensures a low resistance path for discharge of lightning energy.
   (iii) Unplug all the electrical and electronic equipment as soon as the lightning seem likely.
   (iv) Do not used wired phones. Mobile phones are the safest to use.
   (v) Avoid contact with all sorts of pipes and avoid taking a shower during lightning.
   (vi) Monitor lightning from indoors.

3. During a thunderstorm an electrical discharge occurs within the clouds or between the clouds and the ground when sufficient negative and positive charge gathers inside the clouds. When the electric field becomes sufficiently strong electric discharge takes place.

4. Lightning conductor is a safety device installed at the highest point on a building to protect the building from the damaging effects of lightning.

   A lightning conductor consists of a metal rod with spikes at the top and a copper plate attached at the lower and, which is buried deep in the earth.



   Whenever a loud with an electric charge passes over the building, an equal and opposite charge is built on the pointed end of the lightning conductor at the top of the building. This charge cannot be held up by the metal and all of it goes safely to the earth through the metal rod. Thus, the cloud also loses its charge. In this way, when lightning strikes the building, it flows to the earth through the metal rod of the conductor and prevents the building from getting damaged.

5. **Structure of the Earth :** The Earth has three layers.

   Crust : It is the outer most layer of the earth. That is about 570 km thick under the land and 6.11 km thick at the ocean floor.

   Mantle : It lies under the crust and extends up to the depth of 2,900 km. It consists of semi solid rocks and elements like iron, magnesium and calcium.

   Core : It lies below the mantle and is the innermost layer of the earth, that extends to about 6,300 km in depth. The outer core consists of iron and nickel in molten state while the inner core is a sold ball which is made up of iron. The inner core is about 1,200 km in diameter. The temperature at the center of the earth is around 4,000°C and the pressure here is about 3,700,000 atmospheres.

The inner core is solid because of th extremely high pressures prevailing at that depth.

6. **Causes of Earthquakes : Movement of the tectonic plates :** The crust is rock solid and mainly consists of ferro magnesium silicates. It consists of a large number of pieces or blocks called the tectonic plates. Earthquakes happen along the edge of the tectonic plates. The plates move and push against each other. Sometimes these plates snap at the weakest point along a fault line. Big shock waves go out from the focus where the shock waves start. This can be up to 700 km underground. The epicenter is an the surface right above the focus.
7. Few steps we you should take to protect yourself during an earthquake are :
   (i) We must keep crockery items in lower drawers.
   (ii) Wall hangings, paintings, mirrors, fans, lights etc. usually fall during on earthquake. These must be properly fixed on the walls.
   (iii) In high risk seismic zones high rise buildings must be avoided and roofs of single storey houses must be made up of mud or wood.
   (iv) Cupboard drawers must have sturdy latches so that they do not open by tremors.
   (v) The buildings must have a strong foundation.
   (vi) Fire extinguishers must be placed at appropriates place on each floor in multi storey buildings.
   (vii) The maintenance of the building like plastering must be done regularly.
   (viii) Cupboard refrigerators, books shelves etc. must be attached to the walls.
8. Four hazards of earthquakes are :
   (i) Ground shaking, landslides, liquid faction.
   (ii) Tusnami
   (iii) Subsidence and lateral spreading
   (iv) Bridges and dams can be revelry damaged.
9. There are basically two type of charges– positive and negative.
   The charge on ebonite rubbed with fur, a negative (–ve) charge. As the charge on a glass rod rubbed with silk was found to be a different type it was called a positive (+ve) charge. Since like charges repel, two positive or two negative charges repel each other on the other hand as the unlike charges attract, a negative and a positive charge attract each other.
10. Define the following terms :
    (a) **Thunderstorm :** A storm of heavy rain accompanied by lightning, thunder, wind and sometimes hail.
    (b) **Lightning conductor :** It is a safety device installed at the highest point on a building to protect the effects of lightning.
    (c) **Earthquake :** The sudden shaking of the earth's crust in called an earthquake.
    (d) **Seismograph :** The instrument that measures the severity of an earthquake is a seismograph.
    (e) **Tsunami :** A tsunami is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake.

[HOTS]

In hilly areas clouds are comparatively closer to the ground than in the plains. Therefore lightning strikes more frequently in hilly areas. The houses on hills are at a higher altitude compared to houses on the plains. So lightning strikes the hill areas first as they are at a higher altitude.

CHAPTER-13
LIGHT

A. Tick (✓) the correct option :

1. (c) 2. (a) 3. (b) 4. (c)
5. (b) 6. (b) 7. (a) 8. (b)
9. (a) 10. (b)

B. Fill in the blanks :

1. Light
2. incidence, reflection
3. retina
4. spectrum
5. converging lens

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (f) 2. (c) 3. (d) 4. (d)
5. (a) 6. (g) 7. (b)

E. Write one word for the following :

1. Angle of Reflection
2. Focal length
3. Iris
4. Reflected Ray
5. Rainbow

F. Answer the following questions :

1. **Transparent objects :** Those substances or materials, through which things can be seen are called transparent.

   Translucent objects : The materials through which objects can be seen, but not clearly are known as translucent objects.

   Opaque objects : Some materials through which we are not able to see. These objects are called opaque objects.

2. As ray of incidence makes a angle of 90 degree with the reflected ray, angle of incidence

   $= \frac{90°}{2} = 45$ degree.

   So the angle of incidence of a ray is 45 degree.

3. **Lenses :** A piece of any transparent substance having different or same radii of curvature of both surface is called lens.

   (a) **Object is beyond 2F** : When the object is be young 2 F the image is real, inverted and magnified.

   (b) **Object is at 2 F :** When the object is placed at the centre of curvature 2F, a real, same size inverted image is formed on the other side of the lens at 2F.

   (c) **Objects at the principal focus :** When the object is placed at the principal focus of the lens, the image formed is real, inverted and magnified. It is formed on the other side of the lens at infinity.

   (d) **Object is between optical center and principal focus :** When the object is placed between the optical center and the principal focus, the image formed is virtual erect and magnified. It is on the same side of the lens.

4. **Structure of the human eye :**

   (i) **Sclerotic** : It is the outermost thick layer of the eye. It is hard and protects the inner delicate part of the eye.

   (ii) **Cornea :** The sclera continues in the front of the eye as cornea, which is the transparent portion of the eye. It protects the eyes and also helps in focusing light.

   (iii) **Iris :** The coloured part of the eye behind the cornea is called iris. It regulates the amount of light entering the eye by adjusting the size of the pupil.

   (iv) **Lens :** A transparent double convex lens lies behind the iris. It is held at its position by the ciliary muscles which can change the thickness of the lens. The lens focuses light to form an image on the retina.

   (v) **Retina :** It is a delicate membrane just behind the eyeball. It acts as a screen on which the image is formed. It has light sensitive receptors called rods and cones. Cones are sensitive to colour, while rods are sensitive to the intensity of light.

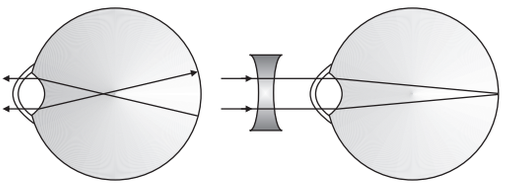
   (vi) **Optic nerve :** It is a bundle of nerves that connects the rods and cones of the retina to the brain. They carry optical message in the form of electrical signals to the brain.

5. **Difference between angle of incidence and angle of reflection are :** The normal line divides that angle between the incident ray and the reflected ray into two equal angles. The angle between incident ray and the normal is known as the angle of incidence. The angle between the reflected ray and the normal is angle of reflection.
6. **Astronomical telescope and its uses :** The telescope use to observe stars, planets, satellites, moon, clestial bodies is called the astronimal telescope.

   This telescope used to see distant objects on the Earth, is called terrestrial telescope. These telescopes have mirrors to make the inverted image, erect. they present erect images of distant objects.
7. **Functions of photographic camera :** Photographic camera is another such device, in which we use the properties of lenses. It is an instrument, which is used to take permanent images of objects on a photographic film. While taking photograph, the photographer see through the view window, Adjust the shutter to control the light falling on the photographic film. After the arrangements are done, presses the button. It opens the shutter for a short time to allow some light to enter the camera. Later the film is treated chemically to get the picture and prepares the negative of the photograph by removing photo sensitive chemical from the parts of film.
8. **Defects of vision :** There are two main defects of the eye :
   (i) Myopia or short sightedness.
   (ii) Hypermetropia or long sightedness.
   (i) **Myopia or short sightedness** : Myopia is the defect of vision in which the object at short distances are seen clearly but distant object are not seen clearly.

   Following are the causes of this defect :
   (i) Ciliary muscles are unable to increase the focal length of the eye lens by contracting.
   (ii) The length of the eye ball is increased.

   In both these situations, the clear image of the distant objects are formed in front of the retina so that the distant objects are seen blurred. A person suffering from myopia can see objects till 4 meter clearly.



   Correction of Myopia : Myopia can be corrected by using a concave lens of suitable focal length.
9. Difference between a real image and virtual image are :

Real Image	Virtual Image
1. It can be taken on screen.	1. It can not be taken on screen.
2. The rays of light after reflection meets at a point.	2. The rays of light after reflection appears to meets at a point.
3. It is inverted.	3. It is erect but laterally inverted.

10. **Concave lens :** The concave lenses diverge a parallel beam of light. As such they are called diverging lenses also. Through a concave lens, objects appears smaller. There are two main types of lenses– Convex and concave lens.
11. Speed of light in air = 3.0×10^8 m/s
    Speed of light in diamond = 0.42 × speed of light in air
    Speed of light in diamond
    $= 0.42 \times 3.0 \times 10^8$ m/s
    Speed of light in diamond $= 1.26 \times 10^8$ m/s
    $n = \frac{3.0 \times 10^8}{1.26 \times 10^8} = 2.4$ $\therefore$ value of diamond $= 2.4$
12. **Luminous objects :** Objects having their own lights are called luminous objects. Ex : sun, stars, electric bulb, burning candle, glow worm etc. have their own light.

13. **Define the following terms :**

(a) **Spectrum :** The band of colours produced when white light is split up is called the spectrum.

(b) **Blind spot :** It is an area on the retina that does not have light sensitive receptors. As blind spot is present at the junction of the optic nerve and the retina, where there are no rods or comes, so no vision is possible at this spot.

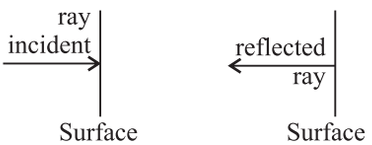
(c) **Regular Reflection :** Specular reflection also known as regular reflection, is the mirror like reflection of waves, such as light from a surface.

(d) **Telescope :** The instrument helpful in seeing distant objects clearly is called telescope.

(e) **Convex lens :** The convex lens is a converging lens. When parallel rays of light pass through a convex lens the refracted rays converge at one point called the principal focus.

(f) **Prism :** A prism is a wedge shaped black of glass. It has two congruent triangular faces and three rectangular faces.

[HOTS]

1. 

The angle of reflection is equal to the angle of incidence, therefore when a ray strikes the mirror at 90 degrees. They ray reflects back in the opposite direction on the same path, that is at 90 degrees.

2. Because the light can't travel as quickly in the water as it does in the air, the light bends around the pencil, causing it to look bent in the water. Basically, the light refraction, given the pencil a slight magnifying effect, which makes the angle appear bigger than it actually is causing the pencil to look crooked.

CHAPTER-14
POLLUTION OF AIR AND WATER

A. Tick (✓) the correct option :

1. (c) 2. (d) 3. (a) 4. (d)
5. (a) 6. (d) 7. (b) 8. (d)
9. (d) 10. (c) 11. (c) 12. (d)

B. Fill in the blanks :

1. Chlorine 2. Sulphur dioxide
3. sulphuric, nitric 4. Pollutants
5. Chemical, Biological
6. Carbon mono oxide

C. Write 'T' for True and 'F' for False :

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

D. Match the following :

1. (b) 2. (d) 3. (a) 4. (c)
5. (f) 6. (e)

E. Write one word for the following statements:

1. Acid rain 2. Potable water
3. Green ham 4. Chlorofluorocarbons

F. Answer the following questions :

1. Three physical methods of purifying water are :

(i) **Boiling :** The easiest way to purify water at home by boiling. Boiling the water for about 15-20 minutes kills all the germs. This method destroys almost all the organic contaminants, excepts the tough cystes of bacteria which can be destroyed only by chemical treatment.

(ii) **Decantation :** It is the process of reparating a solid form a liquid by transferring the liquid carefully from one container to another leaving the solid behind.

(iii) **Filtration :** The water from the sedimentation tank is filtered through layers of sand and gravel. Filtration is also done through activated charcoal, which affords better quality water.

2. Filtration is also done through activated charcoal, which affords better quality water.

Activated charcoal is special type of charcoal made by heating ordinary charcoal is vaccum. This charcoal holds the impurities strongly.

3. Causes of water pollution of water bodies are :
   (i) Direct discharge of industrial and agricultural wastes into water bodies makes the water unfit for human consumption.
   (ii) Oil spills from tankers is a cause of water pollution in seas and oceans.
   (iii) Human activities such as bathing and washing of clothes near water bodies like wells and rivers contaminates their water.
   (iv) Defecation by humans and animals in or near water sources pollutes them.
   (v) Discharge of sewage into lakes and rivers pollutes them.
   (vi) Mining and refining wastes generate hazandous radioactive wastes which may prove fatal to the living being if they are discharged untreated into the water bodies.
4. During Biological pollution, aquatic animal consume this polluted water. This creates a deficiency of oxygen for aquatic orgnisms which may lead to the death of many organism. Polluted water is toxic to aquatic animals and to human beings, when used by them. The metals get stored in fish and they are passed on to the human beings who eat fish. In some cause they prove fatal. More often, they cause serious diseases.
5. Four causes of air pollution are :
   (i) Natural sources of air pollution include dust storms in desert areas, smoke from forest fires, pollen floating in the air and volcanic eruptions.
   (ii) Burning of fuels for household purpose generates harmful gases like carbon dioxide, carbon monoxide and particulate matter.
   (iii) Industries and factories emit harmful gases, like sulphur dioxide chlorine and dust which also adds to air pollution.
   (iv) Thermal power plants and nuclear power plants release harmful gases like sulphur dioxide and radio active pollutants.
6. Steps to be taken to check pollution of water bodies are :
   (i) Domestic and industrial wastes should be made free of pollutants by treating them before releasing them into oceans and rivers.
   (ii) Sewage should be treated before being disposed of into a water body.
   (iii) Restrictions should be imposed on bathing and washing clothes near lakes, ponds and rivers.
   (iv) Excessive use of fertilisers and pesticides should be avoided. Instead the use of bio degradable fertilisers such as compost should be encouraged.
7. Some measures which can help to reduce air pollutions are :
   (i) **Planting trees :** Planting of trees is important for reducing air pollution because trees absorbs excess carbon dioxide and give out oxygen.
   They also help in reducing the dust particles in the air.
   (ii) **Use of smokeless stoves :** Efficiently designed smokeless stove for burning coal, kerosene etc. should be used to reduce air pollution.
   (iii) **Use of smokeless fuels :** Use of smoke. less fuels such as Compressed Natural Gas (CNG) or Liquified Petroleum Gas should be used in automobiles to reduce the emission of carbon particles and harmful gases such as carbon monoxide. The exhaust gases in vehicles should be passed though a catalytic convertor.
8. Carbon monoxide is a deadly poisnous gas which reduce oxygen carrying capacity of blood.

9. **Define the following terns :**

(a) **Green house effect :** Light from the sun travels through the atmosphere and falls on earth. The trapping of radiation by the atmosphere of earth is called greenhouse effect.

(b) **Acid rain :** When sulphuric acid and nitric acid mix with rain water, making the rain acidic. This is called acid rain.

(c) **Global warming :** The gradual increase in the overall temperature of th Earth is called global arming.

(d) **Chlorination :** Purification of water by chlorine tablets is called chlorination.

(e) **SPM :** Tiny solid or liquid particles suspended in the air are known as suspended particulate matter.

(f) **Sedimentation :** The process in which solid impurities of water settles at the bottom of the tank is called sedimentation.

[HOTS]

1. Water needs to be filtered before drinking to protect ourselves from germs and other contaminants. Filteration of water can prevent use from suffering caused by various diseases.
2. Factories contribute a lot in all types of pollution. i.e, water, soil, air and noise pollution. They generated large amount of harmful wastes which can badly put the health of individual, if not properly disposed off. That is why they should not be located in densely populated areas.

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