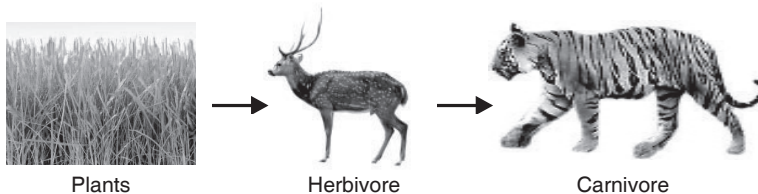


SCIENCE 7 (NCERT SOLUTION)

CHAPTER 1. NUTRITION IN PLANTS

1. Organisms need to take food to get energy for carrying out life processes, to build their bodies, to grow and to repair damaged parts of their bodies.
2. An organism that completely depends on other organisms for food is called parasite such as *Cuscuta*. An organism that takes nutrition from dead and decaying matter is called saprotroph, for example, fungi.
3. Presence of starch in leaves can be tested by performing the iodine test. Iodine turns the starch blue-black.
4. The process of synthesis of food in green plants is called photosynthesis. It occurs mainly in green leaves. To carry out photosynthesis, plants need sunlight, water, carbon dioxide and a green pigment called chlorophyll. During photosynthesis, the chlorophyll in leaves traps sunlight for energy. The water is absorbed by roots and transported to the leaves through stem. Carbon dioxide from air is taken through stomata present on the surface of leaves. Leaves with the help of energy of sunlight, utilise carbon dioxide and water, and synthesise food in the form of carbohydrates releasing oxygen into the air.

5.



6. (a) autotrophs (b) starch (c) chlorophyll (d) carbon dioxide; oxygen
7. (i) *Cuscuta* (ii) Pitcher plant (iii) Stomata
8. (a) ii (b) iii
9. Chlorophyll—leaf, Nitrogen—Bacteria, *Amarbel*—parasite, Animals—Heterotrophs, Insects—Pitcher plant
10. (i) F (ii) F (iii) T (iv) T 11. (ii) 12. (iv)

CHAPTER 2. NUTRITION IN ANIMALS

1. (a) ingestion, digestion, absorption, assimilation; egestion (b) liver (c) gastric (d) villi (e) food vacuole
2. (a) F (b) T (c) T (d) T
3. (a) iii (b) iv
4. Carbohydrates—Sugar, Proteins—Amino acids, Fats—Fatty acids and glycerol
5. Villi are finger-like projections that contain blood vessels. They are found on the inner surface of small intestine. They increase surface area of small intestine to about five times for the absorption of digested food.
6. Bile is produced in liver. Bile helps to digest fat by forming a film around fat molecules so that intestinal juice can work upon it.
7. Cellulose. Cellulose is digested in a sac, called caecum, present at the junction of small and large intestines. Caecum contains cellulose-digesting bacteria. Caecum in humans is reduced and nonfunctional due to absence of cellulose-digesting bacteria. Therefore, it is not digested in humans.
8. Glucose is the simplest carbohydrate. All forms of carbohydrates are digested into glucose for absorption. When we take glucose, it does not need to be digested. It is quickly absorbed and transported to different organs of the body through blood. In the cells, it is broken down with the help of oxygen into carbon dioxide and water to release energy.
9. (i) Small intestine (ii) Buccal cavity (iii) Stomach (iv) Small intestine (v) large intestine
10. *Amoeba* and human beings both take food by engulfing it. But in *Amoeba* digestive juices act upon directly on the solid form of food whereas in human beings the solid food is first chewed and converted into a thin paste for the action of digestive juices on it.
11. (a) iii (b) iv (c) i (d) ii, vii (e) v (f) vi
12. **Hint:** Refer Fig. 2.2

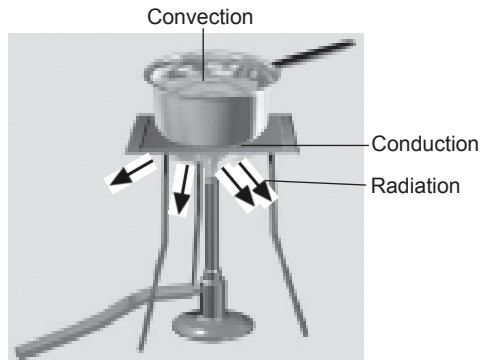
13. No. We cannot survive only on raw, leafy vegetables because they provide vitamins, minerals and roughage. Vitamins and minerals protect us from various diseases and roughage helps in bowel movement. They do not provide energy at all because we cannot digest cellulose present in green leaves. In the absence of energy, our body would not be able to carry out the life processes and hence we would not survive.

CHAPTER 3. FIBRE TO FABRIC

- (a) All parts of black sheep except face and lower legs have wool.
(b) The white fleece is the thick covering of fine hair on the body of the lamb.
- (iii) 3. (iv)
- (i) **Rearing:** It is rearing and feeding a nutritious food to animals for obtaining a good quality product from them.
(ii) **Shearing:** The process of shaving the body of a sheep to obtain fleece is called shearing.
(iii) **Sericulture:** The rearing of silk moths for obtaining silk is called sericulture.
- (ii) Scouring, (iv) Carding (v) Dyeing (vi) Spinning
- Hint:** Refer Fig. 3.8. (Larval and pupal stages)
- Sericulture, moriculture
- 1 (e) 2 (c) 3 (b) 4 (a), (d)
- Down:** 1. SCOUR 2. SILK 3. FIBRE
Across: 1. WOOL 2. MULBERRY 3. CATERPILLAR

CHAPTER 4. HEAT

- Both laboratory and clinical thermometers have glass tube and are based on the principle of expansion of mercury. But they have a number of differences in their construction as well as working.
Hint: Refer 'Answer J-5 of Chapter-4'.
- Conductors: All metals like copper, iron, gold, aluminium, etc.
Insulators: Wood, plastic, glass wool, cotton, etc.
- (a) temperature (b) clinical (c) celsius or fahrenheit (d) radiation
(e) conduction (f) dark
- (i) d; (ii) c; (iii) b; (iv) a
- When we wear more layers of clothing, air gets trapped between these layers. As air is a bad conductor of heat, it prevents heat of the body from escaping. That is why wearing more layers of clothing keeps us warmer than wearing just one thick piece of cloth.
-



- The amount of heat absorbed by objects depends on the colour of its surface. Light colour is poor absorber and radiator of heat and dark colour is good absorber of heat. Since white colour is the least absorber of heat, the outer walls of houses in places of hot climate are painted white so that they become less hot.
- (d) 9. (b) 10. (d) 11. (c)

CHAPTER 5.

ACIDS, BASES AND SALTS

1. **Hint:** Refer 'Table 4.6'.
2. Ammonia is basic in nature.
3. Litmus solution is obtained from lichens. It is used to find the nature of the chemical solutions.
4. Distilled water is neutral because it does not show any effect on any indicator.
5. **Hint:** Refer 'Activity-8'.
6. (i) F (ii) F (iii) T (iv) T (v) F
7. To identify the bottles of soft drinks as acidic, basic or neutral, Dorji would have to taste the liquids using a dropper or a spoon. If he feels sour taste, the drink is an acidic soft drink, if he feels bitter taste, then it is a basic soft drink and when he feels no taste, then the drink is neutral. Thus, he will be able to serve cold drinks according to the customers' demand.
8. (a) Antacid contains magnesium hydroxide which is a base. It neutralises the effect of acid when you suffer from acidity.
(b) When an ant bites, it injects acidic liquid (formic acid) into the skin. The calamine solution is basic and neutralises the acid when applied on the skin and relieves the pain.
(c) **Hint:** Refer 'Answer C-4'.
9. On testing the given liquids with turmeric indicator, its colour changes to red in one liquid. This liquid is a base, i.e., it is sodium hydroxide. In other two liquids, its colour remains yellow. This shows that these liquids are either neutral or acidic. Now, we can test these liquids by using other indicators.
10. When blue litmus paper is dipped in a solution, it remains blue showing the basic or neutral nature of the solution. This is because blue litmus paper does not change its colour in basic and neutral solutions.
11. (iv)

CHAPTER 6.

PHYSICAL AND CHEMICAL CHANGES

1. (a) Chemical change (b) Physical change
(c) Chemical change (d) Physical change
(e) Physical change (f) Chemical change
2. (a) F; Cutting a log of wood into pieces is a physical change.
(b) F; Formation of manure from leaves is a chemical change.
(c) T
(d) F; Iron and rust are different substances.
(e) T
3. (a) calcium carbonate
(b) sodium bicarbonate or sodium hydrogencarbonate
(c) galvanisation; alloying
(d) physical
(e) chemical
4. Chemical change. The gas evolved with bubbles is carbon dioxide. Baking soda contains sodium bicarbonate and lemon juice contains acetic acid. So, they react with each other and form a new substance called carbon dioxide gas.
5. When a candle burns, heat, light and carbon dioxide gas are produced. This shows a chemical change. In this process, melting of wax is a physical change.
Burning of LPG in kitchen shows both the changes because it firstly, converts into gaseous state from liquid state and then starts burning.
6. Setting of curd is a chemical change because curd is a new substance obtained from milk. When a little amount of curd is mixed with lukewarm milk, lactic acid is formed which makes the milk semisolid and sour in taste. Thus, curd is obtained.
7. When wood is burnt, a new substance called ash, is formed along with release of carbon dioxide and carbon monoxide gases. That is why, it is chemical change.
When wood is cut into small pieces, no new substance is formed. Hence, it is a physical change.
8. **Hint:** Refer 'Activity-12'.
9. Painting of an iron gate prevents it from rusting because it prevents iron from coming in contact with air and moisture.
10. In coastal areas, the air is moist and when iron comes in contact with moist air, it gets rusted.
11. (ii)
12. (iii)

CHAPTER 7.

WEATHER, CLIMATE AND ADAPTATIONS OF ANIMALS TO CLIMATE

1. Temperature, Humidity, Rainfall, Wind speed, etc.
2. Maximum temperature occurs at noon when the sunrays fall straight on the ground and minimum temperature occurs in the early mornings.
3. (i) climate (ii) dry; hot (iii) tropics; poles
4. (a) moderately hot and wet (b) very hot and humid (wet)
(c) hot and dry (d) wet
5. Weather changes frequently because it depends on temperature, humidity, cloudiness, sunshine, rainfall and wind speed of a place which are not same on any two days.
6. (i), (v), (vii), (ix), (x) — Tropical rainforest
(ii), (iii), (vi), (vii) — Polar region
(iv) — Tropical rainforest, Polar region
7. Tropical Rainforests have a large population of animals because food is available in plenty and shelter to protect is also available there.
8. This is because animals living in different climates show adaptations in their structure, behaviour, etc. to withstand and survive the extreme conditions of that particular climate. For example, polar bears and penguins are found in polar regions only whereas camels are found in deserts, and elephants, lions, tigers, etc. are found only in dense forests because they are adapted to live in that type of climate only.
9. **Hint:** Refer 'Animals of Indian Tropical Rainforest'.
10. (iv) 11. (i) 12. (i)

CHAPTER 8.

WINDS, STORMS AND CYCLONES

1. (a) moving (b) uneven (c) hot, cold (d) high, low
2. We can find out the wind direction using the following ways:
 - (i) In an open place, hold any light thing like paper piece, leaf, feather, cotton, soil, sand, etc. in hand and release it to fall down freely. Check whether it falls down vertically or follows a slanting path. Note the geographical direction of its displacement. It gives the direction of wind.
 - (ii) Using a wind vane which is a simple instrument used for finding the direction of wind.
3. ● When air moves, clothes hanging on a clothesline start swaying. It is the result of change in air pressure.
● If the wind speed is high, it is difficult to fill up a pitcher with water from a tap. Moving air exerts pressure on freely falling water and hence water does not fall vertically downward into the mouth of pitcher.
4. No, I would not like to buy such a house that has windows but no ventilators because ventilation of air is possible only when hot air would go out after rising up and cold air from outside would come in.
5. Wind exerts pressure on the things that come in its path. Hanging banners and hoardings having large surface area will get more air pressure if holes are not made in them. Also, it may be a chance to break the ropes or damage the base in which they are fixed.
6. In case, a cyclone approaches our village or town, we shall help our neighbours by following ways:
 - We shall inform them about the cyclone.
 - We shall help them to make necessary arrangements to shift essential household items like food, clothes, medicines, etc., domestic animals, vehicles, etc. to safer places.
 - We shall suggest them to keep ready the phone numbers of all emergency services like police, fire brigade, ambulance, disaster management department, NGOs, etc.
 - We shall also advise them to avoid driving on the roads full with water, to drink fresh water, not to touch wet electrical appliances and wires, etc.
7. **Hint:** Refer 'Answer E-4'.
8. (iii)
9. (i)

CHAPTER 9.

SOIL

1. (iii) 2. (ii)
3. (i) (b); (ii) (c); (iii) (a); (iv) (e); (v) (d)

4. The soil is formed by the breaking down of rocks by the action of wind, water and climate. This process is called weathering. During the process, dead and decaying organic matter mixes with the rock particles. The nature of soil depends upon the rocks from which it has been formed and the type of vegetation that grows in it.
5. Clayey soil is useful for growing cereals like wheat and gram because it has good water-holding capacity. Clayey soil containing clay and organic matter is ideal for paddy crop. Thus, clayey soil is useful for crops.

6. **Hint:** Refer 'Table 10.1'.

7. **Hint:** Refer 'Fig. 10.1'.

$$\begin{aligned}
 8. \quad & \text{Time taken} = 40 \text{ min} \\
 & \text{Volume of water percolated} = 200 \text{ ml} \\
 & \text{Hence, rate of percolation (mL/min)} = \frac{\text{volume of water (mL)}}{\text{percolation time (min)}} \\
 & = \frac{200 \text{ mL}}{40 \text{ min}} = 5 \text{ mL/min}
 \end{aligned}$$

9. Soil pollution can be prevented by:

- Proper treatment of industrial wastes.
- Adopting proper methods for the management of solid waste disposal.
- Recycling of materials like glass, paper, plastic, etc.
- Reusing of materials like plastic bag, cloth, paper, etc.
- Reducing the use of fertilisers, pesticides, etc.

Soil erosion can be prevented by:

- Planting trees on bare soil.
- Controlling deforestation.
- Controlled grazing by the cattle.
- Avoiding excessive ploughing of soil.

10. **Across:** 2. EROSION 5. PESTICIDE 6. CLAY 7. EARTHWORM

Down: 1. WIND 3. WHEAT 4. SANDY 5. PROFILE

CHAPTER 10.

RESPIRATION IN ORGANISMS

1. During running, the demand for energy in the body is increased but the supply of oxygen to produce the energy is limited. So, to meet the increased demand of oxygen in the body, an athlete breathes faster and deeper after finishing the race.
2. **Hint:** Refer 'Table 11.1'.
3. When we inhale a lot of dust-laden air, the dust particles that get into the nasal passage, irritate the sensory lining of nasal cavity. This causes sneezing and unwanted particles are thrown out.
4. Test-tube A would have the highest concentration of CO₂ because there is no plant to use CO₂ released by the snail.
5. (a) iii (b) ii (c) ii (d) ii
6. (a) iii (b) iv (c) i (d) v (e) ii (f) vi
7. (i) F (ii) F (iii) T (iv) F (v) T
8. (i) Tracheae (ii) Ribs (iii) Diaphragm (iv) Stomata (v) Spiracles
(vi) Lungs (vii) Nostrils (viii) Yeast (ix) Cockroach
9. (b)

CHAPTER 11.

TRANSPORTATION IN ANIMALS AND PLANTS

1. (i) (b), (e) (ii) (d) (iii) (a) (iv) (c)
2. (i) Arteries (ii) red blood (iii) capillaries (iv) heartbeat (v) urea
(vi) salts (vii) urine (viii) transpiration
3. (a) (i) (b) (iii)
4. Transport of materials is necessary in a plant for the distribution of water and minerals absorbed by roots and the food prepared by leaves to each and every cell of the plant body. Similarly, in an animal, it is necessary for the distribution of food and oxygen to different cells of the body and to carry waste from all the cells to the organs of excretion.
5. In the absence of platelets in the blood, in case of injury, the blood would not clot at wound site and the bleeding would not stop. This will lead to the death of the person.
6. Stomata are small openings on the surface of leaves.

- (a) Stomata allow the gaseous exchange between plant and air, i.e., carbon dioxide to enter from atmosphere and oxygen to go out during photosynthesis.
- (b) They carry out transpiration by expelling excess of water which helps to pull water to great heights in tall trees and also cools the plant.
7. The process of transpiration, which is the evaporation of water from the leaves, generates a suction pull. The suction pull raises the water from roots to the different heights of the plant. In this way, the water is transported to all the cells. Also, it cools the plant and helps to absorb minerals from the soil.
8. The blood has two components—Plasma and blood cells (For details refer 'Blood').
9. Blood is needed for the distribution of nutrients and oxygen as well as to collect and carry waste from all the cells of body to the organs of excretion.
10. The presence of an oxygen-carrying pigment called haemoglobin in red blood cells gives red colour to the blood.
11. The heart is a pumping organ of the body which pumps blood continuously since birth till death of an organism. It pumps deoxygenated, i.e., impure blood collected from all parts of the body to the lungs for purification and oxygenated, i.e., pure blood collected from lungs to all parts of the body.
12. Waste products are necessary to be excreted because if they accumulate in the body, they will prove to be toxic.
13. **Hint:** Refer 'Fig. 12.6'.

CHAPTER 12. REPRODUCTION IN PLANTS

1. (a) vegetative propagation (b) unisexual (c) pollination
(d) fertilisation (e) wind, water; animals
2. **Hint:** Refer 'Asexual Reproduction'.
3. Sexual reproduction is a method of reproduction which involves the fusion of male and female gametes. It results in the formation of zygote which develops into a new individual.
4. Asexual reproduction involves the formation of new individuals by division of parent body itself. The individuals formed by asexual reproduction are all alike.
Sexual reproduction involves the formation of male and female gametes (sex cells) and their fusion which results in the formation of zygote. The zygote develops into a new individual. The individuals formed by sexual reproduction are not alike.
5. **Hint:** Refer 'Fig. 13.12'.
6. **Hint:** Refer 'Answer D-9 (c)'.
7. **Hint:** Refer 'Fertilisation'.
8. **Hint:** Refer 'Fruit and Seed Dispersal'.
9. (a) iii (b) v (c) ii (d) i (e) iv
10. (a) iv (b) i (c) iv (d) ii (e) ii

CHAPTER 13. MOTION AND TIME

1. (i) Oscillatory motion (ii) Straight line motion
(iii) Circular motion (iv) Oscillatory motion
(v) Oscillatory motion (vi) Straight line motion
2. (ii), (iv), (v) are not correct.
3. Total time taken = 32 s, Number of oscillations = 20

$$\therefore \text{Time period} = \frac{\text{Total time taken}}{\text{No. of oscillations}} = \frac{32 \text{ s}}{20} = 1.6 \text{ s}$$
4. Distance = 240 km, Time = 4 h

$$\text{Speed of the train} = \frac{\text{Distance}}{\text{Time}} = \frac{240 \text{ km}}{4 \text{ h}} = 60 \text{ km/h}$$
5. At 08.30 AM, the reading of odometer = 57321.0 km
 At 08.50 AM, the reading of odometer = 57336.0 km
 The distance covered by the car during this time interval
 $= 57336.0 - 57321.0 = 15.0 \text{ km}$
 Time interval = 08.50 AM – 08.30 AM = 20 min

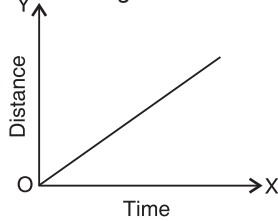
$$\text{Speed} = \frac{\text{Distance covered}}{\text{Time taken}} = \frac{15 \text{ km}}{20 \text{ min}} = 0.75 \text{ km/min}$$

$$\begin{aligned} \text{Speed (in km/h)} &= \frac{15 \text{ km}}{20 \text{ min}} = \frac{15 \text{ km}}{\frac{20}{60} \text{ h}} = 45 \text{ km/h} (\because 1 \text{ h} = 60 \text{ min}) \\ \therefore \text{Time} &= 15 \text{ min, Speed} = 2 \text{ m/s} \\ \therefore 1 \text{ min} &= 60 \text{ s} \\ \therefore 15 \text{ min} &= 15 \times 60 = 900 \text{ s} \\ \text{Distance} &= \text{Speed} \times \text{time} \\ &= 2 \text{ m/s} \times 900 \text{ s} = 1800 \text{ m or } 1.8 \text{ km} \end{aligned}$$

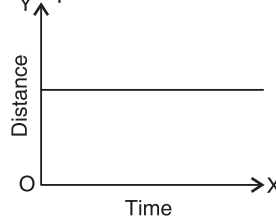
($\because 1000 \text{ m} = 1 \text{ km}$)

Thus, distance between Salma's school and her house = 1.8 km

7. (i) Car moving with a constant speed (ii) Car parked on a side road



Nature of graph: Inclined straight line



Nature of graph: Horizontal straight line

8. (ii)

9. (iv)

10. (ii) 25 km

Explanation:

$$\text{In case I, Speed} = 40 \text{ km/h, Time} = 15 \text{ min} = \frac{15}{60} \text{ h}$$

$$\therefore \text{Distance covered} = 40 \text{ km/h} \times \frac{15}{60} \text{ h} = 10 \text{ km}$$

$$\text{In case II, Speed} = 60 \text{ km/h, Time} = 15 \text{ min} = \frac{15}{60} \text{ h}$$

$$\therefore \text{Distance covered} = 60 \text{ km/h} \times \frac{15}{60} \text{ h} = 15 \text{ km}$$

Thus, total distance covered = 10 + 15 = 25 km

11. From the photographs given in Fig. 13.1 and Fig. 13.2 (NCERT Book), we find that the blue car moves 1.5 cm.

Hence, actual distance covered by the blue car = 1.5 \times 100 m = 150 m

($\because 1 \text{ cm} = 100 \text{ m}$)

$$\text{Time interval} = 10 \text{ s}$$

$$\text{Speed of the blue car} = \frac{\text{Distance}}{\text{Time}} = \frac{150 \text{ m}}{10 \text{ s}} = 15 \text{ m/s}$$

12. The graph of vehicle A is more steeper than that of vehicle B.

Hence, vehicle A is moving faster.

13. (iii) It is because curved graph indicates nonuniform motion.

CHAPTER 14.

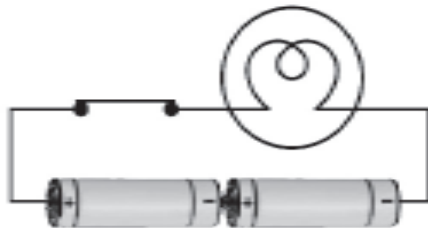
ELECTRIC CURRENT AND ITS EFFECTS

1. Hint: Refer Table 15.1.

2. Hint: Refer Fig. of screen matter on page 196.



4. Yes, the cells are not connected properly. We can change them as follows:



5. Heating effect and magnetic effect of electricity current.
6. When the current is switched on, the compass needle kept nearby the conducting wire shows a deflection. This is because when electric current is passed in a conductor, it develops a magnetic field around it and behaves like a magnet.
7. No, because there is no electric source in the arrangement and hence current will not pass.
8. (a) positive (b) battery (c) becomes red hot and radiates heat (d) fuse
9. (a) F (b) T (c) F (d) T
10. No, plastic bags are made of nonmagnetic material and hence they do not get attracted towards electromagnet.
11. It would be possible to complete the circuit by replacing a fuse with a piece of wire. But, I do not agree with this because a fuse is a safety device which has a special wire made of tin or alloy of tin and copper. This wire has low melting point and melts in case of overloading or short-circuiting. Thus, it protects the circuit as well as appliances from damage.
12. The circuit made by Zubeda may have following defects that would be checked out and corrected:
- Connection of terminals between two cells—If positive terminal of one cell is not attached with negative terminal of another cell then make them correct.
 - Tightness of rubber band—If rubber band does not hold the metal strips tightly, then change the rubber band with a new one or use two three rubber bands to make them tight.
 - Loose connection of connecting wires—Check whether the connection of wires to the metal strips is loose, if yes, tie it tightly. Also, the terminals can be rubbed with a piece of sand paper before making connection.
13. (i) No
(ii) The order of glowing of the three bulbs will be C, B and A because current flows from positive terminal to negative terminal. But flow of current is so fast that it cannot be detected separately. Hence, all the bulbs will appear to glow at the same time.

CHAPTER 15.

LIGHT

1. (a) virtual (b) mirror (c) plane (d) real (e) lens
2. (a) F (b) T (c) T (d) F (e) F
3. (a) (v); (b) (ii), (vi); (c) (i); (d) (iii); (e) (vi)
4. The features of an image formed by a plane mirror are as follows:
- The size of the image is equal to the size of the object.
 - The image is upright or erect and virtual.
 - The image is at the same distance behind the mirror as the object is in front of it.
 - The image is laterally inverted.
5. The images formed by a plane mirror are laterally inverted. But some of the letters of English alphabet like A, H, I, M, O, T, U, V, W, X and Y appear exactly the same when viewed in a plane mirror. It is because these letters are symmetrical about the vertical axis.
6. A virtual image is formed when the rays of light reflected from a mirror or refracted from a lens appear to meet at a point. It is always erect and is formed behind the mirror or lens. Hence, it cannot be obtained on a screen. We find

virtual images in different situations like our own face in a looking glass, traffic behind a vehicle viewed in a side mirror, expiry date, price, etc. viewed by a magnifying glass, etc.

7. Hint: Refer Answer C-4.
8. Hint: Refer Answer D-3.
9. Concave mirror
10. Concave lens
11. (ii)
12. (iii)
13. (ii)

CHAPTER 16.

WATER: A PRECIOUS RESOURCE

1. (a) T (b) F (c) F (d) T
2. When it rains, some water seeps under the ground. This water gets accumulated between the impervious hard rocks and hence groundwater gets recharged.
3. The continuous pumping out of groundwater by tubewells will lower the water table in the long run.
4. To minimise the use of water, plants should be watered just sufficiently around their roots. They should not be overwatered.
5. **Hint:** Refer Answer D-4.
6. (a) wells, tubewells (b) solid, liquid, gas (c) aquifer (d) infiltration
7. (iii)
8. (iv)
9. **Hint:** Refer Fig. 17.5.

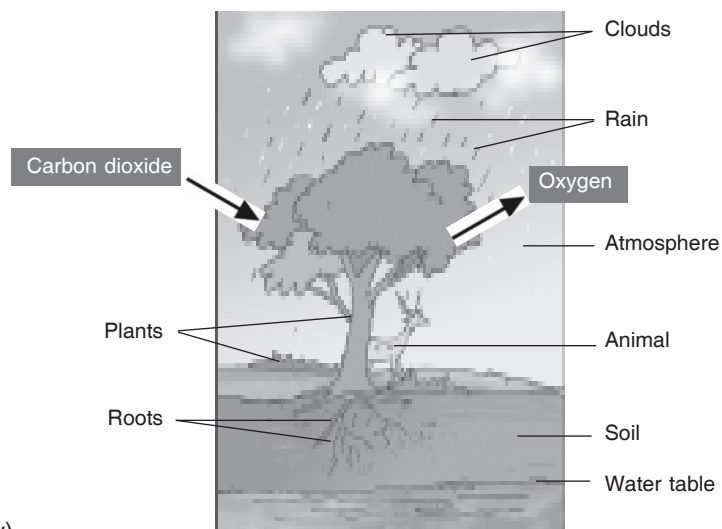
CHAPTER 17.

FORESTS: OUR LIFELINE

1. Animals dwelling in the forests release carbon dioxide during respiration which is taken by forest plants for photosynthesis. Many birds, bees and arboreal animals help in the pollination of flowers. Animals that are herbivores eat fruits, leaves, etc. of plants and help in the dispersal of seeds and fruits to new places. At last, when they die, their bodies are decomposed by microorganisms into simpler inorganic matter in the soil. From the soil, they are absorbed by the plants in the form of nutrients.
2. Forests are natural absorbers of rain. The trees prevent the free flow of rainwater. This allows it to seep into the ground which reduces the chances of flood.
3. Decomposers are the organisms which convert the dead plants and animals into humus by breaking down complex organic matter of their bodies into the simpler inorganic form.
Bacteria and fungi are decomposers. They decompose or break down the dead remains of plants and animals into simpler inorganic forms in the soil. These are taken as nutrients by the plants.
4. The animals and human beings release carbon dioxide in the air during respiration which is taken by green plants of the forest for carrying out photosynthesis. During the process of photosynthesis, oxygen is released as by-product by the plants. Thus, by taking carbon dioxide from air and releasing oxygen into the air, the forest maintains the balance between oxygen and carbon dioxide in the atmosphere.
5. The part of a plant or plant as a whole when dies, it is immediately acted upon by the microorganisms and converted into simpler inorganic forms which get mixed with the soil and are taken as nutrients by the plants. The dead animals in the forest become the food of scavengers such as hyena, jackal, vulture, crow, etc. and insects. In this way, nutrients are recycled. So, there is no accumulation of waste in the forest.
6. Wood, medicines, gum, resins and oils.
7. (a) pollination (b) air; water (c) understory (d) soil
8. Issues related to forests are of great concern. People living in or around the forests or in the bigger cities away from forests are equally affected and benefitted by the forests.
Forests are source of food, medicines, many useful materials such as timber, firewood, fibres, resins, gums, etc. They regulate the climate and water cycle. They purify air, control floods, check soil erosion and air pollution, and maintain supply of nutrients. They provide habitat to large variety of wild animals. They are home for tribals. Plants, animals and microbes together make the forest a 'dynamic living entity'. Therefore, any type of disbalance in any of the components of forest will affect us. So each and every aspect related to forest must be taken care of.
9. Plants, animals and microbes keep the forest ecosystem in a dynamic equilibrium. Green plants make food for all nongreen living forms. Herbivores and nongreen plants obtain food from them. Carnivores eat herbivores. Omnivores eat both plants and animals. Scavengers obtain their food from bodies of dead animals and decomposers decompose

the dead remains of plants and animals. Thus, to provide better opportunities of food and habitat, a variety of animals and plants is required in a forest.

10.



11. (iv)

12. (ii)

13. (iii)

CHAPTER 18. WASTEWATER STORY

- (a) pollutants (b) sewage (c) sludge (d) polythene bags, rags
- The water containing waste from various sources is called sewage. The untreated sewage contaminates the water as it contains a large number of harmful microbes. This leads to the death of aquatic organisms on a large scale. The consumption of contaminated water can cause various waterborne diseases like typhoid, cholera, dysentery, etc.
- Used oils and fats should not be thrown in drain because they may choke the drain.
- To get clarified water, following steps are involved:
 - First of all, water is passed through bar screens to remove large objects suspended in it.
 - Then this water is passed into the grit and sand removal tanks where stones, sand, etc. are removed.
 - Now, this water is sent to sedimentation tanks where solid organic matter settles down as sludge on the bottom of the tanks while grease and oils float on the surface. The sludge is removed continuously by scrapers and grease and oils are skimmed off.
 - The water thus obtained is called clarified water.
- The organic solid matter collected at the bottom of the sedimentation tank is called sludge. The sludge is sent into digesters where it is decomposed by anaerobic bacteria and biogas is released.
- The human excreta contains a lot of pathogens in it. If untreated excreta is released into waterbodies, it will contaminate the water. The consumption of such water can lead to several waterborne diseases like typhoid, jaundice, cholera, etc.
- Chlorine and ozone are used to disinfect water.
- Bar screens remove large objects suspended in water and make the water fit to be passed through various equipments installed in a wastewater treatment plant.
- Proper sanitation helps to keep away diseases. As several diseases are communicable, they spread due to unhygienic conditions around us. Insects such as houseflies, mosquitoes, cockroaches, etc. flourish in unhygienic conditions and spread the pathogens of many diseases. Thus, sanitation and diseases have a deep relationship.
- As active citizens, we can help maintain sanitation in our locality as follows:
 - We should throw garbage in the municipality bins only.
 - We should not litter the roads and public places.
 - If any drain is choked or overflowing, we should inform the municipality about it.
 - We should create awareness among people to keep the surroundings clean.
- Across: 3. SEWAGE 4. SLUDGE 6. SANITATION 8. EXCRETA**
Down: 1. WASTE WATER 2. SEWER 5. BACTERIA 7. OZONE
- (ii)