SCIENCE 7

(NCERT TEXTBOOK SOLUTION)

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Chapter 1.
Nutrition in Plants

1. Why do organisms take food?

Ans. 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. Distinguish between a parasite and a saprotroph.

Ans. An organism that completely depends on other organisms for food is called parasite such as *Cuscuta*. An organsim that takes nutrition from dead and decaying matter is called saprotroph, for example, fungi.

3. How would you test the presence of starch in leaves?

Ans. Presence of starch in leaves can be tested by performing the iodine test. Iodine turns the starch blue-black.

4. Give a brief description of the process of synthesis of food in green plants.

Ans. 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. Show with the help of a sketch that plants are the ultimate source of food.

Ans.

Plants → Herbivore → Carnivore

6. Fill in the blanks:

(a) Green plants are called _____ since they synthesise their own food.
(b) The food synthesised by plants is stored as _____.
(c) In photosynthesis solar energy is absorbed by the pigment called _____.
(d) During photosynthesis plants take in _____ and release _____ gas.

Ans. (a) autotrophs (b) starch (c) chlorophyll (d) carbon dioxide; oxygen

7. Name the following:

(i) A parasitic plant with yellow, slender and branched stem.
(ii) A plant that is partially autotrophic.
(iii) The pores through which leaves exchange gases.

Ans. (i) *Cuscuta* (ii) Pitcher plant (iii) Stomata

8. Tick the correct answer:

(a) Cuscuta is an example of:
(i) autotroph (ii) parasite (iii) saprotroph (iv) host
(b) The plant which traps and feeds on insects is:
(i) Cuscuta (ii) china rose (iv) pitcher plant (iv) rose

Ans. (a) ii (b) iii

9. Match the items given in Column I with those in Column II:

Column I	Column II
Chlorophyll	Rhizobium
Nitrogen	Heterotrophs
Cuscuta	Pitcher plant
Animals	Leaf
Insects	Parasite

Ans. Chlorophyll – leaf, Nitrogen – *Rhizobium*, *Cuscuta* – parasite, Animals – Heterotrophs, Insects – Pitcher plant

10. Mark 'T' if the statement is true and 'F' if it is false:
(i) Carbon dioxide is released during photosynthesis.
(ii) Plants which synthesise their food are called saprotrophs.
(iii) The product of photosynthesis is not a protein.
(iv) Solar energy is converted into chemical energy during photosynthesis.

Ans. (i) F (ii) F (iii) T (iv) T

11. Choose the correct option from the following:

Which part of the plant takes in carbon dioxide from the air for photosynthesis?
(i) Root hair (ii) Stomata (iii) Leaf veins (iv) Petals

Ans. (ii)

12. Choose the correct option from the following:

Plants take carbon dioxide from the atmosphere mainly through their:
(i) roots (ii) stem (iii) flowers (iv) leaves

Ans. (iv)

13. Why do farmers grow many fruits and vegetable crops inside large green houses? What are the advantages to the farmers?

Ans. Many fruits and vegetables are grown in large greenhouses to protect them from extreme harsh climate and provide suitable temperature and conditions to grow.
Advantages to the farmers are as follows:
(i) It protects crops from diseases and adverse harsh climatic conditions.
(ii) It protects crops from wind, storm, rodents and grazing animals.

CHAPTER 2.
NUTRITION IN ANIMALS

1. Fill in the blanks:
(a) The main steps of nutrition in humans are _____, _____, _____, _____ and _____.
(b) The largest gland in the human body is _____.
(c) The stomach releases hydrochloric acid and _____ juices which act on food.
(d) The inner wall of the small intestine has many finger-like outgrowths called _____.
(e) Amoeba digests its food in the _____.

Ans. (a) ingestion, digestion, absorption, assimilation, egestion
(b) liver (c) gastric (d) villi (e) food vacuole

2. Mark 'T' if the statement is true and 'F' if it is false:
(a) Digestion of starch starts in the stomach.
(b) The tongue helps in mixing food with saliva.
(c) The gall bladder temporarily stores bile.
(d) The ruminants bring back swallowed grass into their mouth and chew it for some time.

Ans. (a) F (b) T (c) T (d) T

3. Tick (✓) mark the correct answer in each of the following:
(a) Fat is completely digested in the
(i) stomach (ii) mouth (iii) small intestine (iv) large intestine
(b) Water from the undigested food is absorbed mainly in the
(i) stomach (ii) foodpipe (iii) small intestine (iv) large intestine

Ans. (a) iii (b) iv

4. Match the items of Column I with those given in Column II:

Column I	Column II
Food components	Product(s) of digestion
Carbohydrates	Fatty acids and glycerol
Proteins	Sugar
Fats	Amino acids

Ans. Carbohydrates–Sugar, Proteins–Amino acids, Fats–Fatty acids and glycerol

5. What are villi? What is their location and function?

Ans. 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. Where is the bile produced? Which component of the food does it help to digest?

Ans. 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. Name the type of carbohydrate that can be digested by ruminants but not by humans. Give the reason also.

Ans. 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. Why do we get instant energy from glucose?

Ans. 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. Which part of the digestive canal is involved in:

(i) absorption of food _____.
(ii) chewing of food _____.
(iii) killing of bacteria _____.
(iv) complete digestion of food _____.
(v) formation of faeces _____.

Ans. (i) Small intestine (ii) Buccal cavity (iii) Stomach (iv) Small intestine (v) Large intestine

10. Write one similarity and one difference between the nutrition in amoeba and human beings.

Ans. *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. Match the items of Column I with suitable items in Column II

Column I	Column II
(a) Salivary gland	**(i) Bile juice secretion**
(b) Stomach	**(ii) Storage of undigested food**
(c) Liver	**(iii) Saliva secretion**
(d) Rectum	**(iv) Acid release**
(e) Small intestine	**(v) Digestion is completed**
(f) Large intestine	**(vi) Absorption of water**
	(vii) Release of faeces

Ans. (a) iii (b) iv (c) i (d) ii, vii (e) v (f) vi

12. Label Fig. 2.11 of the digestive system.

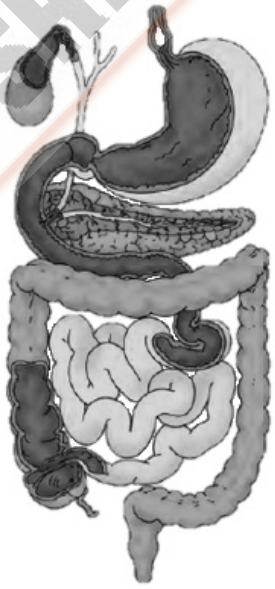
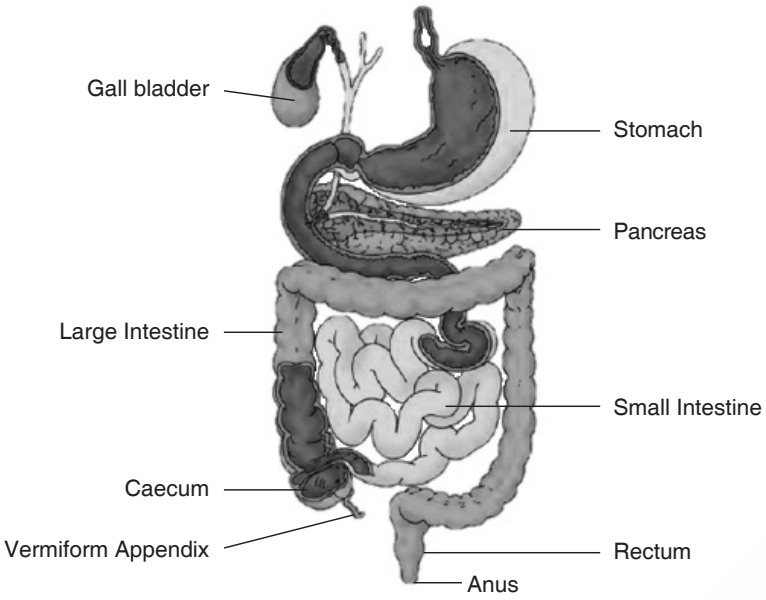


Fig. 2.11 A part of the human digestive system

Ans.



13. Can we survive only on raw, leafy vegetables/grass? Discuss.

Ans. 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 processses and hence we would not survive.

CHAPTER 3.
HEAT

1. State similarities and differences between the laboratory thermometer and the clinical thermometer.

Ans. 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.

Laboratory Thermometer	Clinical Thermometer
1. A laboratory thermometer is much longer than a clinical thermometer.	1. A clinical thermometer is shorter than a laboratory thermometer.
2. The range of temperature that can be measured with a laboratory thermometer is –10°C to 110°C.	2. The range of temperature for a clinical thermometer is 35°C to 42°C.
3. The laboratory thermometer is read while its bulb is in close contact with the object whose temperature is to be measured.	3. The clinical thermometer is removed from the body to note down the temperature.
4. The laboratory thermometer has a straight capillary.	4. The capillary of a clinical thermometer has a kink, just above its bulb

2. Give two examples each of conductors and insulators of heat.

Ans. Conductors: All metals like copper, iron, gold, aluminium, etc.
Insulators: Wood, plastic, glass wool, cotton, etc.

3. Fill in the blanks :

(a) The hotness of an object is determined by its _____.
(b) Temperature of boiling water cannot be measured by a _____ thermometer.
(c) Temperature is measured in degree _____.
(d) No medium is required for transfer of heat by the process of _____.
(e) A cold steel spoon is dipped in a cup of hot milk. Heat is transferred to its other end by the process of _____.
(f) Clothes of _____ colours absorb more heat better than clothes of light colours.

Ans. (a) temperature (b) clinical (c) celsius or fahrenheit (d) radiation (e) conduction (f) dark

4. Match the following :

(i) Land breeze blows during	**(a) summer**
(ii) Sea breeze blows during	**(b) winter**
(iii) Dark coloured clothes are preferred during	**(c) day**
(iv) Light coloured clothes are preferred during	**(d) night**

Ans. (i) d; (ii) c; (iii) b; (iv) a

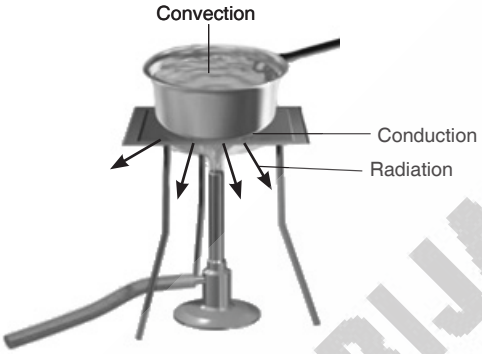
5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing.

Ans. 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.

6. Look at Fig. 3.13. Mark where the heat is being transferred by conduction, by convection and by radiation.

Fig. 3.13

Ans.



7. In places of hot climate it is advised that the outer walls of houses be painted white. Explain.

Ans. 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.

8. One litre of water at 30°C is mixed with one litre of water at 50°C. The temperature of the mixture will be

(a) 80°C
(b) more than 50°C but less than 80°C
(c) 20°C
(d) between 30°C and 50°C

Ans. (d)

9. An iron ball at 40°C is dropped in a mug containing water at 40°C. The heat will

(a) flow from iron ball to water.
(b) not flow from iron ball to water or from water to iron ball.
(c) flow from water to iron ball.
(d) increase the temperature of both.

Ans. (b)

10. A wooden spoon is dipped in a cup of ice cream. Its other end

(a) becomes cold by the process of conduction.
(b) becomes cold by the process of convection.
(c) becomes cold by the process of radiation.
(d) does not become cold.

Ans. (d)

11. Stainless steel pans are usually provided with copper bottoms. The reason for this could be that

(a) copper bottom makes the pan more durable.

(b) such pans appear colourful.

(c) copper is a better conductor of heat than the stainless steel.

(d) copper is easier to clean than the stainless steel.

Ans. (c)

Chapter 4.
Acids, Bases and Salts

1. State differences between acids and bases.

Ans.

Acids	Bases
1. Acids are sour in taste.	1. Bases are bitter in taste.
2. Most acids are corrosive in nature, but all acids are not corrosive.	2. Most bases are also corrosive in nature, but all bases are not corrosive.
3. Acids are soluble in water.	3. All bases are not soluble in water.
4. Acids turn blue litmus red.	4. Bases turn red litmus blue.
5. Acids do not give any soapy feeling.	5. Bases give a soapy feeling when rubbed with fingers.
6. Acids can be tested with indicators which give them specific colours.	6. Bases also can be tested with indicators which give them specific colours.

2. Ammonia is found in many household products, such as window cleaners. It turns red litmus blue. What is its nature?

Ans. Ammonia is basic in nature.

3. Name the source from which litmus solution is obtained. What is the use of this solution?

Ans. Litmus solution is obtained from lichens. It is used to find the nature of the chemical solutions.

4. Is the distilled water acidic/basic/neutral? How would you verify it?

Ans. Distilled water is neutral because it does not show any effect on any indicator.

5. Describe the process of neutralisation with the help of an example.

Ans. **Procedure:** Take a test tube and add 10 mL dilute hydrochloric acid to it. Observe its colour. Now, add two drops of phenolphthalein to it. Shake gently. Notice, if there is any colour change. Now, add a drop of sodium hydroxide solution with the help of a dropper and shake gently. Notice, if any colour appears in the solution. Keep adding sodium hydroxide solution dropwise and keep shaking till the colour of the solution becomes pink. Add one drop of dilute hydrochloric acid to this solution. Note your observation. Touch the bottom of the test tube and observe if there is any change in temperature.

Observation: No colour change occurs when phenolphthalein is added to dilute hydrochloric acid. The solution remains colourless. Pink colour appears when sodium hydroxide is added to this solution. On adding a drop of dilute hydrochloric acid to this solution, the solution becomes colourless. The solution becomes pink again on adding a drop of sodium hydroxide. The test tube becomes warm.

Conclusion: When dilute hydrochloric acid and sodium hydroxide are mixed in just right amounts, the acid and the base neutralise each other and the resulting liquid is neutral.

6. Mark 'T' if the statement is true and 'F' if it is false:

(i) Nitric acid turn red litmus blue.

(ii) Sodium hydroxide turns blue litmus red.

(iii) Sodium hydroxide and hydrochloric acid neutralise each other and form salt and water.

(iv) Indicator is a substance which shows different colours in acidic and basic solutions.

(v) Tooth decay is caused by the presence of a base.

Ans. (i) F (ii) F (iii) T (iv) T (v) F

7. Dorji has a few bottles of soft drink in his restaurant. But, unfortunately, these are not labelled. He has to serve the drinks on the demand of customers. One customer wants acidic drink, another wants basic and third one wants neutral drink. How will Dorji decide which drink is to be served to whom?

Ans. 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. Explain why:
(a) An antacid tablet is taken when you suffer from acidity.
(b) Calamine solution is applied on the skin when an ant bites.
(c) Factory waste is neutralised before disposing it into the water bodies.

Ans. (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) The factory wastes contain harmful acids and bases. If these wastes are allowed to flow directly into the waterbodies, they will harm aquatic plants and animals. Therefore, it is wise to neutralise the factory wastes before disposing them off into rivers or lakes.

9. Three liquids are given to you. One is hydrochloric acid, another is sodium hydroxide and third is a sugar solution. How will you identify them? You have only turmeric indicator.

Ans. 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. Blue litmus paper is dipped in a solution. It remains blue. What is the nature of the solution? Explain.

Ans. 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. Consider the following statements:
(a) Both acids and bases change colour of all indicators.
(b) If an indicator gives a colour change with an acid, it does not give a change with a base.
(c) If an indicator changes colour with a base, it does not change colour with an acid.
(d) Change of colour in an acid and a base depends on the type of the indicator.

Which of these statements are correct?
(i) All four (ii) a and d (iii) b, c and d (iv) only d

Ans. (iv)

CHAPTER 5.
PHYSICAL AND CHEMICAL CHANGES

1. Classify the changes involved in the following processes as physical or chemical changes:
(a) Photosynthesis
(b) Dissolving sugar in water
(c) Burning of coal
(d) Melting of wax
(e) Beating aluminium to make aluminium foil
(f) Digestion of food

Ans. (a) Chemical change (b) Physical change
(c) Chemical change (d) Physical change
(e) Physical change (f) Chemical change

2. State whether the following statements are true or false. In case a statement is false, write the corrected statement in your notebook.
(a) Cutting a log of wood into pieces is a chemical change.
(b) Formation of manure from leaves is a physical change.
(c) Iron pipes coated with zinc do not get rusted easily.
(d) Iron and rust are the same substances.
(e) Condensation of steam is not a chemical change.

Ans. (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. Fill in the blanks in the following statements:

(a) When carbon dioxide is passed through lime water, it turns milky due to the formation of _____.

(b) The chemical name of baking soda is _____.

(c) Two methods by which rusting of iron can be prevented are _____ and _____.

(d) Changes in which only _____ properties of a substance change are called physical changes.

(e) Changes in which new substances are formed are called _____ changes.

Ans. (a) calcium carbonate

(b) sodium bicarbonate or sodium hydrogencarbonate

(c) galvanisation; alloying

(d) physical

(e) chemical

4. When baking soda is mixed with lemon juice, bubbles are formed with the evolution of a gas. What type of change is it? Explain.

Ans. 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, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

Ans. 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. How would you show that setting of curd is a chemical change?

Ans. 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. Explain why burning of wood and cutting it into small pieces are considered as two different types of changes.

Ans. 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. Describe how crystals of copper sulphate are prepared.

Ans. Fill a test tube half with water and heat it. When the water starts boiling, add a teaspoonful of copper sulphate to it. Stir well and keep adding copper sulphate till no more amount of powder can be dissolved. Filter the solution using a filter paper and collect it in a test tube. Cover the filtrate with a filter paper and place it in a test-tube stand undisturbed. Allow it to cool to the room temperature. Observe the solution after few hours. Blue-coloured crystals of copper sulphate are seen in the test tube.

9. Explain how painting of an iron gate prevents it from rusting.

Ans. Painting of an iron gate prevents it from rusting because it prevents iron from coming in contact with air and moisture.

10. Explain why rusting of iron objects is faster in coastal areas than in deserts.

Ans. In coastal areas, the air is moist and when iron comes in contact with moist air, it gets rusted.

11. The gas we use in the kitchen is called liquified petroleum gas (LPG). In the cylinder it exist as a liquid. When it comes out from the cylinder it becomes a gas (Change – A) then it burns (Change – B). The following statements pertain to these changes. Choose the correct one.

(i) Process – A is a chemical change.

(ii) Process – B is a chemical change.

(iii) Both processes A and B are chemical changes.

(iv) None of these processes is a chemical change.

Ans. (ii)

12. Anaerobic bacteria digest animal waste and produce biogas (Change – A).

The biogas is then burnt as fuel (Change – B). The following statements pertain to these changes. Choose the correct one.

(i) Process – A is a chemical change.

(ii) Process – B is a chemical change.

(iii) Both processes A and B are chemical changes.

(iv) None of these processes is a chemical change.

Ans. (iii)

CHAPTER 6.
RESPIRATION IN ORGANISMS

1. Why does an athlete breathe faster and deeper than usual after finishing the race?

Ans. 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. List the similarities and differences between aerobic and anaerobic respiration.

Ans. Similarities between aerobic and anaerobic respiration:

1. Both produce energy from food.
2. Both these processes use glucose.
3. Both occur inside the living cells.

Differences between aerobic and anaerobic respiration

Aerobic respiration		Anaerobic respiration	
1.	It occurs in the presence of oxygen.	1.	It occurs in the absence of oxygen.
2.	Glucose is completely oxidised.	2.	Glucose is oxidised incompletely.
3.	End products are carbon dioxide and water.	3.	End products are either ethyl alcohol or lactic acid and carbon dioxide.
4.	More energy is produced.	4.	Very little energy is produced.
5.	It occurs in most of the plants and animals.	5.	It occurs in few organisms like yeast, bacteria and some parasitic flatworms.

3. Why do we often sneeze when we inhale a lot of dust-laden air?

Ans. When we inhale a lot of dust-laden air, the dust particles that get into the nasal passage, irritate the sensory linning of nasal cavity. This causes sneezing and unwanted particles are thrown out.

4. Take three test-tubes. Fill ¾th of each with water. Label them A, B and C. Keep a snail in test-tube A, a water plant in test-tube B and in C, keep snail and plant both. Which test-tube would have the highest concentration of CO_2?

Ans. Test-tube A would have the highest concentration of CO_2 because there is no plant to use CO_2 released by the snail.

5. Tick the correct answer:

(a) In cockroaches, air enters the body through
(i) lungs **(ii) gills**
(iii) spiracles **(iv) skin**

(b) During heavy exercise, we get cramps in the legs due to the accumulation of
(i) carbon dioxide **(ii) lactic acid**
(iii) alcohol **(iv) water**

(c) Normal range of breathing rate per minute in an average adult person at rest is:
(i) 9–12 **(ii) 15–18**
(iii) 21–24 **(iv) 30–33**

(d) During exhalation, the ribs
(i) move outwards **(ii) move downwards**
(iii) move upwards **(iv) do not move at all**

Ans. (a) iii (b) ii (c) ii (d) ii

6. Match the items in Column I with those in Column II:

Column I	Column II
(a) Yeast	**(i) Earthworm**
(b) Diaphragm	**(ii) Gills**
(c) Skin	**(iii) Alcohol**
(d) Leaves	**(iv) Chest cavity**
(e) Fish	**(v) Stomata**
(f) Frog	**(vi) Lungs and skin**
	(vii) Tracheae

Ans. (a) iii (b) iv (c) i (d) v (e) ii (f) vi

7. Mark 'T' if the statement is true and 'F' if it is false:

(i) During heavy exercise the breathing rate of a person slows down.

(ii) Plants carry out photosynthesis only during the day and respiration only at night.

(iii) Frogs breathe through their skins as well as their lungs.

(iv) The fishes have lungs for respiration.

(v) The size of the chest cavity increases during inhalation.

Ans. (i) F (ii) F (iii) T (iv) F (v) T

8. Given below is a square of letters in which are hidden different words related to respiration in organisms. These words may be present in any direction— upwards, downwards, or along the diagonals. Find the words for your respiratory system. Clues about those words are given below the square.

S	V	M	P	L	U	N	G	S
C	Z	G	Q	W	X	N	T	L
R	M	A	T	I	D	O	T	C
I	Y	R	X	Y	M	S	R	A
B	R	H	I	A	N	T	A	Y
S	T	P	T	B	Z	R	C	E
M	I	A	M	T	S	I	H	A
S	P	I	R	A	C	L	E	S
N	E	D	K	J	N	S	A	T

(i) The air tubes of insects

(ii) Skeletal structures surrounding chest cavity

(iii) Muscular floor of chest cavity

(iv) Tiny pores on the surface of leaf

(v) Small openings on the sides of the body of an insect

(vi) The respiratory organs of human beings

(vii) The openings through which we inhale

(viii) An anaerobic organism

(ix) An organism with tracheal system

Ans. (i) Tracheae (ii) Ribs (iii) Diaphragm (iv) Stomata (v) Spiracles (vi) Lungs (vii) Nostrils (viii) Yeast (ix) Cockroach

9. The mountaineers carry oxygen with them because:

(a) At an altitude of more than 5 km there is no air.

(b) The amount of air available to a person is less than that available on the ground.

(c) The temperature of air is higher than that on the ground.

(d) The pressure of air is higher than that on the ground.

Ans. (b)

CHAPTER 7.

TRANSPORTATION IN ANIMALS AND PLANTS

1. Match structures given in Column I with functions given in Column II.

Column I	Column II
(i) Stomata	**(a) Absorption of water**
(ii) Xylem	**(b) Transpiration**
(iii) Root hairs	**(c) Transport of food**
(iv) Phloem	**(d) Transport of water**
	(e) Synthesis of carbohydrates

Ans. (i) (b), (e) (ii) (d) (iii) (a) (iv) (c)

2. Fill in the blanks.

(i) The blood from the heart is transported to all parts of the body by the _____.

(ii) Haemoglobin is present in _____ cells.

(iii) Arteries and veins are joined by a network of _____.

(iv) The rhythmic expansion and contraction of the heart is called _____.
(v) The main excretory product in human beings is _____.
(vi) Sweat contains water and _____.
(vii) Kidneys eliminate the waste materials in the liquid form called _____.
(viii) Water reaches great heights in the trees because of suction pull caused by _____.

Ans. (i) Arteries (ii) red blood (iii) capillaries (iv) heartbeat (v) urea (vi) salts (vii) urine (viii) transpiration

3. Choose the correct option:

(a) In plants, water is transported through
(i) xylem **(ii) phloem**
(iii) stomata **(iv) root hair**

(b) Water absorption through roots can be increased by keeping the plants
(i) in the shade **(ii) in dim light**
(iii) under the fan **(iv) covered with a polythene bag**

Ans. (a) (i) (b) (iii)

4. Why is transport of materials necessary in a plant or in an animal? Explain.

Ans. 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. What will happen if there are no platelets in the blood?

Ans. 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. What are stomata? Give two functions of stomata.

Ans. 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. Does transpiration serve any useful function in the plants? Explain.

Ans. 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. What are the components of blood?

Ans. The blood has two components–Plasma and blood cells.

9. Why is blood needed by all the parts of a body?

Ans. 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. What makes the blood look red?

Ans. The presence of an oxygen-carrying pigement called haemoglobin in red blood cells gives red colour to the blood.

11. Describe the function of the heart.

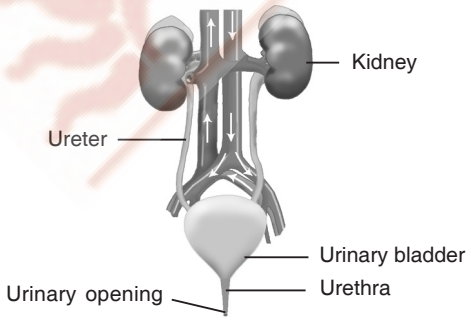
Ans. The heart is a pumping organ of the body which pumps blood continuously since birth till death of an organism. It pumps deoxygenated, i.e., impure blood collected from all parts of the body to the lungs for purification and oxygenated, i.e., pure blood collected from lungs to all parts of the body.

12. Why is it necessary to excrete waste products?

Ans. Waste products are necessary to be excreted because if they accumulate in the body, they will prove to be toxic.

13. Draw a diagram of the human excretory system and label the various parts.

Ans.



Human excretory system

Chapter 8.
Reproduction in Plants

1. Fill in the blanks:
(a) Production of new individuals from the vegetative part of parent is called _____.
(b) A flower may have either male or female reproductive parts. Such a flower is called _____.
(c) The transfer of pollen grains from the anther to the stigma of the same or of another flower of the same kind is known as _____.
(d) The fusion of male and female gametes is termed as _____.
(e) Seed dispersal takes place by means of _____, _____ and _____.

Ans. (a) vegetative propagation (b) unisexual (c) pollination (d) fertilisation (e) wind, water; animals

2. Describe the different methods of asexual reproduction. Give examples.

Ans. Different methods of asexual reproductition are as follows:
(a) **Budding:** In this process, a small bulb-like projection comes out from the parent cell. It is called bud. Example: Yeast
(b) **Fission:** In this process, an individual divides into two or more new individuals. Example: Bacteria
(c) **Fragmentation:** In this process, new organism is formed from pieces of body. Example: *Spirogyra*
(d) **Spore Formation:** In this process, tiny spores develop in a structure called sporangia. They float in air and get transferred to other places. Example: *Rhizopus*.

3. Explain what you understand by sexual reproduction.

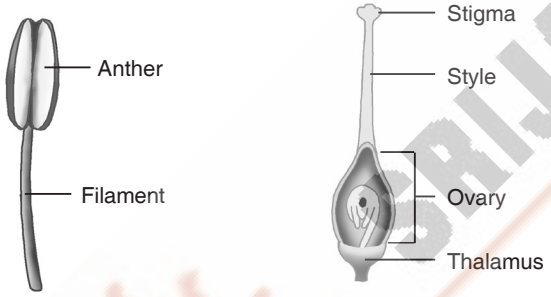
Ans. Sexual reproduction is a method of reproduction which involves the fusion of male and female gametes. It results in the formation of zygote which develops into a new individual.

4. State the main difference between asexual and sexual reproduction.

Ans. 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. Sketch the reproductive parts of a flower.

Ans.



Stamen (male part) Pistil (female part)

6. Explain the difference between self-pollination and cross-pollination.

Ans. In self-pollination, the pollen grains are transferred to the stigma of same flower or of different flower of the same plant while in cross-pollination, pollen grains are transferred to the stigma of another flower borne on a different plant of the same kind.

7. How does the process of fertilisation take place in flowers?

Ans. On reaching the stigma, a pollen grain grows out into a thin pollen tube. The pollen tube extends through the style, reaches the ovary and enters the ovule. The pollen tube contains two male gametes, one of which fuses with the female gamete or egg cell and forms a zygote. This process of fusion of male and female gamete is called fertilisation.

8. Describe the various ways by which seeds are dispersed.

Ans. Various methods of dispersal of seeds and fruits are:
- **Dispersal by Wind:** Seeds of some plants have wings attached to them or are hairy and light. Such seeds float in air or are blown away by wind to distant places.

- **Dispersal by Water:** Seeds of some plants are either spongy or have floating devices. Such seeds float on water and reach far off places.
- **Dispersal by Animals:** Seeds of some plants have spines or hooks which cling to the bodies of animals and are carried to long distances. Some seeds are eaten by animals with fruit pulp and passed out undigested in the feaces.
- **Dispersal by Animals:** Seeds of some plants are enclosed in such fruits which burst open with sudden jerks and the seeds are scattered away from the parent plant.

9. Match items in Column I with those in Column II:

Column I	Column II
(a) Bud	**(i) Maple**
(b) Eyes	**(ii) *Spirogyra***
(c) Fragmentation	**(iii) Yeast**
(d) Wings	**(iv) Bread mould**
(e) Spores	**(v) Potato**
	(vi) Rose

Ans. (a) iii (b) v (c) ii (d) i (e) iv

10. Tick (✓) the correct answer:

(a) The reproductive part of a plant is the
(i) leaf (ii) stem (iii) root (iv) flower

(b) The process of fusion of the male and the female gametes is called
(i) fertilisation (ii) pollination (iii) reproduction (iv) seed formation

(c) Mature ovary forms the
(i) seed (ii) stamen (iii) pistil (iv) fruit

(d) A spore producing organism is
(i) rose (ii) bread mould (iii) potato (iv) ginger

(e) *Bryophyllum* can reproduce by its
(i) stem (ii) leaves (iii) roots (iv) flower

Ans. (a) iv (b) i (c) iv (d) ii (e) ii

CHAPTER 9.
MOTION AND TIME

1. Classify the following as motion along a straight line, circular or oscillatory motion:
(i) Motion of your hands while running.
(ii) Motion of a horse pulling a cart on a straight road.
(iii) Motion of a child in a merry-go-round.
(iv) Motion of a child on a see-saw.
(v) Motion of the hammer of an electric bell.
(vi) Motion of a train on a straight bridge.

Ans. (i) Oscillatory motion (ii) Straight line motion (iii) Circular motion (iv) Oscillatory motion (v) Oscillatory motion (vi) Straight line motion

2. Which of the following are not correct?
(i) The basic unit of time is second.
(ii) Every object moves with a constant speed.
(iii) Distances between two cities are measured in kilometres.
(iv) The time period of a given pendulum is constant.
(v) The speed of a train is expressed in m/h.

Ans. (ii), (iv), (v) are not correct.

3. A simple pendulum takes 32 s to complete 20 oscillations. What is the time period of the pendulum?

Ans. Total time taken = 32 s, Number of oscillations = 20

$$\therefore \quad \text{Time period} = \frac{\text{Total time taken}}{\text{No. of oscillations}} = \frac{32\ \text{s}}{20} = 1.6\ \text{s}$$

4. The distance between two stations is 240 km. A train takes 4 hours to cover this distance. Calculate the speed of the train.

Ans. Distance = 240 km, Time taken = 4 h

$$\text{Speed of the train} = \frac{\text{Distance}}{\text{Time}} = \frac{240\ \text{km}}{4\ \text{h}} = 60\ \text{km/h}$$

5. The odometer of a car reads 57321.0 km when the clock shows the time 08:30 AM. What is the distance moved by the car, if at 08:50 AM, the odometer reading has changed to 57336.0 km? Calculate the speed of the car in km/min during this time. Express the speed in km/h also.

Ans. 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 km

Time interval = 08.50 AM – 08.30 AM = 20 min

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

$$\text{Speed (in km/h)} = \frac{15\text{ km}}{20\text{ min}} = \frac{15\text{ km}}{\frac{20}{60}\text{ h}} = 45\text{ km/h} \qquad (\because 1\text{ h} = 60\text{ min})$$

6. Salma takes 15 minutes from her house to reach her school on a bicycle. If the bicycle has a speed of 2 m/s, calculate the distance between her house and the school.

Ans. Time = 15 min, Speed = 2 m/s

$\because$ 1 min = 60 s

$\therefore$ 15 min = 15 × 60 = 900 s

Distance = Speed × time

= 2 m/s × 900 s = 1800 m or 1.8 km $(\because 1000\text{ m} = 1\text{ km})$

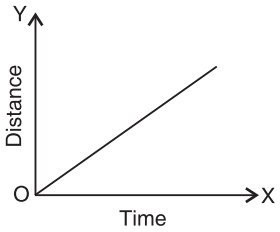
Thus, distance between Salma's school and her house = 1.8 km

7. Show the shape of the distance-time graph for the motion in the following cases:

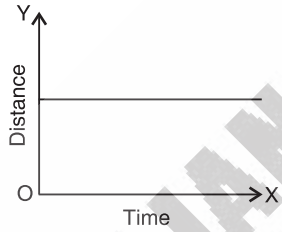
(i) A car moving with a constant speed.

(ii) A car parked on a side road.

Ans. (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. Which of the following relations is correct?

(i) Speed = Distance × Time **(ii) Speed = Distance/time**

(iii) Speed = Time/Distance **(iv) Speed = 1/Distance × Time**

Ans. (ii)

9. The basic unit of speed is:

(i) km/min **(ii) m/min**

(iii) km/h **(iv) m/s**

Ans. (iv)

10. A car moves with a speed of 40 km/h for 15 minutes and then with a speed of 60 km/h for the next 15 minutes. The total distance covered by the car is:

(i) 100 km **(ii) 25 km**

(iii) 15 km **(iv) 10 km**

Ans. (ii)

Explanation:

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

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

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

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

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

11. Suppose the two photographs, shown in Fig. 9.1 and Fig. 9.2, had been taken at an interval of 10 seconds. If a distance of 100 metres is shown by 1 cm in these photographs, calculate the speed of the fastest car.

Ans. From the photographs given in Fig. 9.1 and Fig. 9.2 (NCERT Book), we find that the fastest (green) car moves 2 cm. Hence, actual distance covered by the green car = 2 × 100 m = 200 m (∵ 1 cm = 100 m)

Time interval = 10 s

Speed of the green car = $\frac{\text{Distance}}{\text{Time}} = \frac{200\text{ m}}{10\text{ s}} = 20$ m/s

12. Fig. 9.15 shows the distance-time graph for the motion of two vehicles A and B. Which one of them is moving faster?

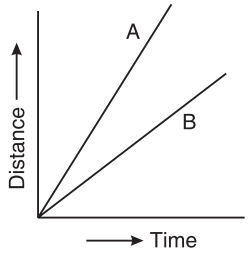
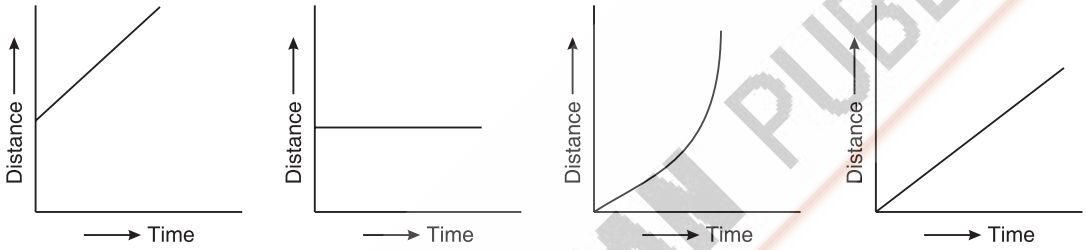


Fig. 9.15 Distance-time graph for the motion of two cars

Ans. The graph of vehicle A is more steeper than that of vehicle B. Hence, vehicle A is moving faster.

13. Which of the following distance-time graphs shows a truck moving with speed which is not constant?

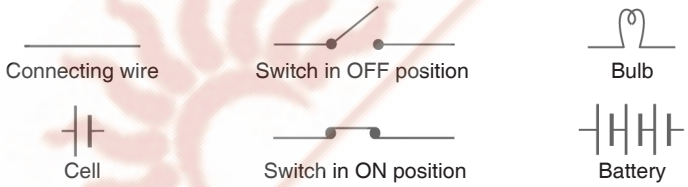


Ans. (iii) It is because a curved graph indicates nonuniform motion.

CHAPTER 10.
ELECTRIC CURRENT AND ITS EFFECTS

1. Draw in your notebook the symbols to represent the following components of electrical circuits: connecting wires, switch in the 'OFF' position, bulb, cell, switch in the 'ON' position, and battery

Ans.



2. Draw the circuit diagram to represent the circuit shown in Fig.10.21.

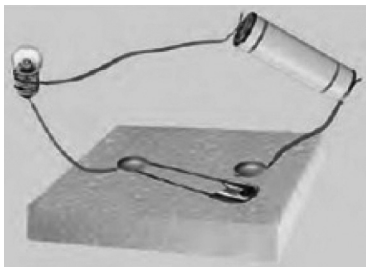
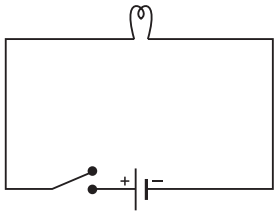


Fig. 10.21

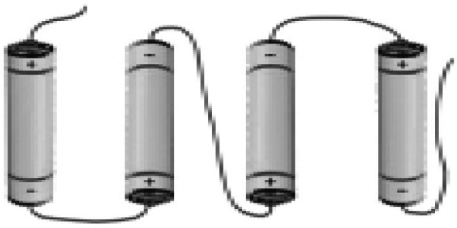
Ans.



3. **Fig.10.22 shows four cells fixed on a board. Draw lines to indicate how you will connect their terminals with wires to make a battery of four cells.**

Fig. 10.22

Ans.



4. **The bulb in the circuit shown in Fig.10.23 does not glow. Can you identify the problem? Make necessary changes in the circuit to make the bulb glow.**

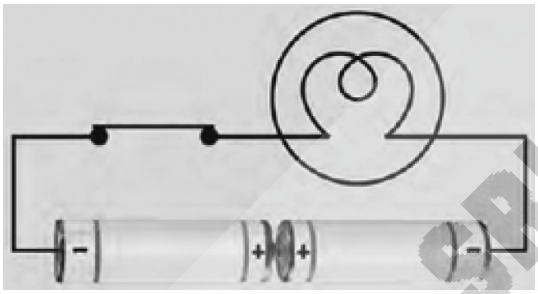
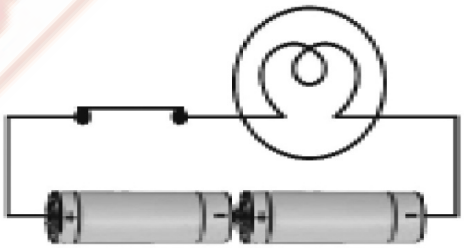


Fig. 10.23

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



5. **Name any two effects of electric current.**

Ans. Heating effect and magnetic effect of electricity current.

6. **When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain.**

Ans. 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. Will the compass needle show deflection when the switch in the circuit shown by Fig.10.24 is closed?

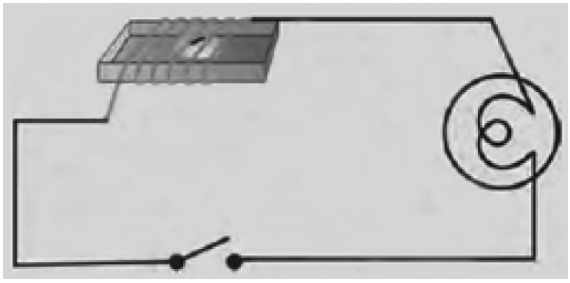


Fig. 10.24

Ans. No, because there is no electric source in the arrangement and hence current will not pass.

8. Fill in the blanks:

(a) Longer line in the symbol for a cell represents its _____ terminal.

(b) The combination of two or more cells is called a _____.

(c) When current is switched 'on' in a room heater, it _____.

(d) The safety device based on the heating effect of electric current is called a _____.

Ans. (a) positive (b) battery (c) becomes red hot and radiates heat (d) fuse

9. Mark 'T' if the statement is true and 'F' if it is false:

(a) To make a battery of two cells, the negative terminal of one cell is connected to the negative terminal of the other cell.

(b) When the electric current through the fuse exceeds a certain limit, the fuse wire melts and breaks.

(c) An electromagnet does not attract a piece of iron.

(d) An electric bell has an electromagnet.

Ans. (a) F (b) T (c) F (d) T

10. Do you think an electromagnet can be used for separating plastic bags from a garbage heap? Explain.

Ans. No, plastic bags are made of nonmagnetic material and hence they do not get attracted towards electromagnet.

11. An electrician is carrying out some repairs in your house. He wants to replace a fuse by a piece of wire. Would you agree? Give reasons for your response.

Ans. Though, 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. Zubeda made an electric circuit using a cell holder shown in Fig. 10.4, a switch and a bulb. When she put the switch in the 'ON' position, the bulb did not glow. Help Zubeda in identifying the possible defects in the circuit.

Ans. The circuit made by Zubeda may have following defects that would be checked out and corrected:

(i) 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.

(ii) Tightness of rubber hand – 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.

(iii) 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. In the circuit shown in Fig. 10.25

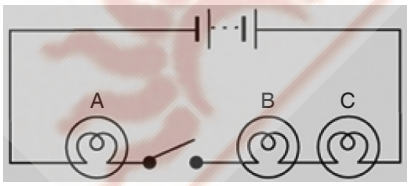


Fig. 10.25

(i) Would any of the bulb glow when the switch is in the 'OFF' position?

(ii) What will be the order in which the bulbs A, B and C will glow when the switch is moved to the 'ON' position?

Ans. (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 11.
LIGHT

1. Fill in the blanks:

(a) An image that cannot be obtained on a screen is called _____.

(b) Image formed by a convex _____ is always virtual and smaller in size.

(c) An image formed by a _____ mirror is always of the same size as that of the object.

(d) An image which can be obtained on a screen is called a _____ image.

(e) An image formed by a concave _____ cannot be obtained on a screen.

Ans. (a) virtual (b) mirror (c) plane (d) real (e) lens

2. Mark 'T' if the statement is true and 'F' if it is false:

(a) We can obtain an enlarged and erect image by a convex mirror.

(b) A concave lens always form a virtual image.

(c) We can obtain a real, enlarged and inverted image by a concave mirror.

(d) A real image cannot be obtained on a screen.

(e) A concave mirror always form a real image.

Ans. (a) F (b) T (c) T (d) F (e) F

3. Match the items given in Column I with one or more items of Column II.

Column I	Column II
(a) A plane mirror	**(i) Used as a magnifying glass.**
(b) A convex mirror	**(ii) Can form image of objects spread over a large area.**
(c) A convex lens	**(iii) Used by dentists to see enlarged image of teeth.**
(d) A concave mirror	**(iv) The image is always inverted and magnified.**
(e) A concave lens	**(v) The image is erect and of the same size as the object.**
	(vi) The image is erect and smaller in size than the object.

Ans. (a) (v); (b) (ii), (vi); (c) (i); (d) (iii); (e) (vi)

4. State the characteristics of the image formed by a plane mirror.

Ans. 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. Find out the letters of English alphabet or any other language known to you in which the image formed in a plane mirror appears exactly like the letter itself. Discuss your findings.

Ans. 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. What is a virtual image? Give one situation where a virtual image is formed.

Ans. A virtual image is formed when the rays of light reflected form 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. State two differences between a convex and a concave lens.

Ans. A lens which has a bulge at the centre and is narrow towards the edges, is called a convex or converging lens. It is because it gathers the rays of light falling on it at a point.

A lens which is thin at the centre and thick towards the edges, is called a concave or diverging lens. It is because it spreads the rays of light falling on it.

8. Give one use each of a concave and a convex mirror.

Ans. Concave mirrors are used as:

- reflectors in solar furnaces to attain very high temperature.
- reflectors in torches, headlights of vehicles, in telescopes, microscopes, etc.
- a dentist's mirror, to see an enlarged image of the tooth.
- make-up mirrors at beauty parlours.
- shaving mirrors by the barbers.

Convex mirrors are used:

- for vigilance at big shops and warehouses.

- as side mirrors or rear view mirrors in vehicles.
- as distance view mirrors at the turning points of narrow staircases.

9. Which type of mirror can form a real image?

Ans. Concave mirror

10. Which type of lens forms always a virtual image?

Ans. Concave lens

Choose the correct option in questions 11–13.

11. A virtual image larger than the object can be produced by a

(i) concave lens (ii) concave mirror
(iii) convex mirror (iv) plane mirror

Ans. (ii)

12. David is observing his image in a plane mirror. The distance between the mirror and his image is 4 m. If he moves 1 m towards the mirror, then the distance between David and his image will be

(i) 3 m (ii) 5 m
(iii) 6 m (iv) 8 m

Ans. (iii)

13. The rear view mirror of a car is a plane mirror. A driver is reversing his car at a speed of 2 m/s. The driver sees in his rear view mirror the image of a truck parked behind his car. The speed at which the image of the truck appears to approach the driver will be

(i) 1 m/s (ii) 2 m/s
(iii) 4 m/s (iv) 8 m/s

Ans. (ii)

CHAPTER 12.
FORESTS: OUR LIFELINE

1. Explain how animals dwelling in the forest help it grow and regenerate.

Ans. 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. Explain how forests prevent floods.

Ans. 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 food.

3. What are decomposers? Name any two of them. What do they do in the forest?

Ans. 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. Explain the role of forest in maintaining the balance between oxygen and carbon dioxide in the atmosphere.

Ans. 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 relasing oxygen into the air, the forest maintains the balance between oxygen and carbon dioxide in the atmosphere.

5. Explain why there is no waste in a forest.

Ans. 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. List five products we get from forests?

Ans. Wood, medicines, gum, resins and oils.

7. Fill in the blanks:

(a) The insects, butterflies, honeybees and birds help flowering plants in _____.
(b) A forest is a purifier of _____and _____.
(c) Herbs form the _____ layer in the forest.

(d) The decaying leaves and animal droppings in a forest enrich the _____.

Ans. (a) pollination (b) air; water (c) understorey (d) soil

8. Why should we worry about the conditions and issues related to forests far from us?

Ans. 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 componets of forest will affect us. So each and every aspect related to forest must be taken care of.

9. Explain why there is a need of variety of animals and plants in a forest.

Ans. 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. In Fig. 12.15, the artist has forgotten to put the labels and directions on the arrows. Mark the directions on the arrows and label the diagram using the following labels:

clouds, rain, atmosphere, carbon dioxide, oxygen, plants, animals, soil, roots, water table.

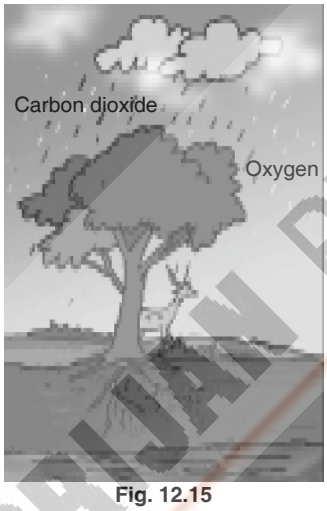
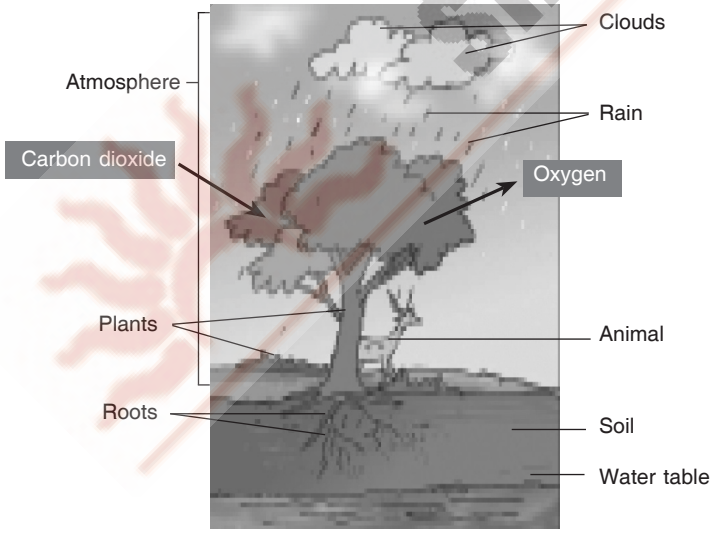


Fig. 12.15

Ans.



11. Which of the following is not a forest product?

(i) Gum

(ii) Plywood

(iii) Sealing wax

(iv) Kerosene

Ans. (iv)

12. Which of the following statements is not correct?

(i) Forests protect the soil from erosion.

(ii) Plants and animals in a forest are not dependent on one another.

(iii) Forests influence the climate and water cycle.

(iv) Soil helps forests to grow and regenerate.

Ans. (ii)

13. Micro-organisms act upon the dead plants to produce

(i) sand (ii) mushrooms (iii) humus (iv) wood

Ans. (iii)

CHAPTER 13.
WASTEWATER STORY

1. Fill in the blanks:

(a) Cleaning of water is a process of removing _____.

(b) Wastewater released by houses is called _____.

(c) Dried _____ is used as manure.

(d) Drains get blocked by _____ and _____.

Ans. (a) pollutants (b) sewage (c) sludge (d) polythene bags, rags

2. What is sewage? Explain why it is harmful to discharge untreated sewage into rivers or seas.

Ans. 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.

3. Why should oils and fats be not released in the drain? Explain.

Ans. Used oils and fats should not be thrown in drain because they may choke the drain.

4. Describe the steps involved in getting clarified water from wastewater.

Ans. 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 scrappers and grease and oils are skimmed off.
- The water thus obtained is called clarified water.

5. What is sludge? Explain how it is treated.

Ans. 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.

6. Untreated human excreta is a health hazard. Explain.

Ans. 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.

7. Name two chemicals used to disinfect water.

Ans. Chlorine and ozone are used to disinfect water.

8. Explain the function of bar screens in a wastewater treatment plant.

Ans. 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.

9. Explain the relationship between sanitation and disease.

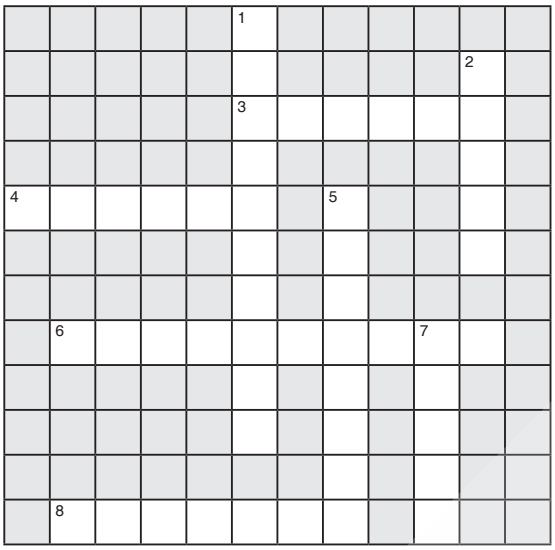
Ans. Proper sanitation helps to keep away diseases. As several diseases are communicable, they spread due to unhygienic conditions around us. Insects such as houseflies, mosquitoes, cockroaches, etc., fluorish in unhygienic conditions and spread the pathogens of many diseases. Thus, sanitation and diseases have a deep relationship.

10. Outline your role as an active citizen in relation to sanitation.

Ans. 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.

11. Here is a crossword puzzle: Good luck!



Across

3. Liquid waste products
4. Solid waste extracted in sewage treatment
6. A word related to hygiene
8. Waste matter discharged from human body

Down

1. Used water
2. A pipe carrying sewage
5. Micro-organisms which causes cholera
7. A chemical to disinfect water

Ans. Across: 3. SEWAGE **4.** SLUDGE **6.** SANITATION **8.** EXCRETA
Down: 1. WASTE WATER **2.** SEWER **5.** BACTERIA **7.** OZONE

12. Study the following statements about ozone:

(a) It is essential for breathing of living organisms.
(b) It is used to disinfect water.
(c) It absorbs ultraviolet rays.
(d) Its proportion in air is about 3%.

Which of these statements are correct?

(i) (a), (b) and (c)
(ii) (b) and (c)
(iii) (a) and (d)
(iv) All four

Ans. (ii)

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