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NCERT SOLUTION'S (SCIENCE)

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Chapter 1

Nutrition in Plants

1. Why do organisms take food?

Ans:

Food is needed by all organisms for many purposes:

(a) The main function of food is to help in growth.

(b) Food provides energy to do our work.

(c) Food is also needed for repairing and replacement of damaged body parts.

(d) Food gives us resistance to fight against diseases.

2. Distinguish between a parasite and a saprotroph?

Ans.

Parasites

1. A plant (or animal) which lives on or inside another organism (called host) and derives the food from it, is called a parasite.

2. The living organism (from whose body food is obtained) is called host of the parasite. The parasite plants climb on the host plants from which they get all the food.

Saprophytes

1. Those non-green plants which obtain their food (or nutrition) from dead and decaying, matter are called saprophytes.

2. The non-green plants called fungi derive their food from dead and decaying organic matter, so fungi are saprophytes.

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

Ans.

The presence of starch in leaves can be tested by Iodine test. When we remove chlorophyll from leaf by boiling it in alcohol and then put 2 drops of iodine solution, its colour change to blue indicates the presence of starch.

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

Ans:

During photosynthesis, chlorophyll containing cells of leaves, in the presence of sunlight, use carbon dioxide and water to synthesise\ carbohydrates. The process can be represented in an equation:

$$\text{Carbon di oxide} + \text{Water} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{Glucose} + \text{Oxygen}$$

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

Ans.

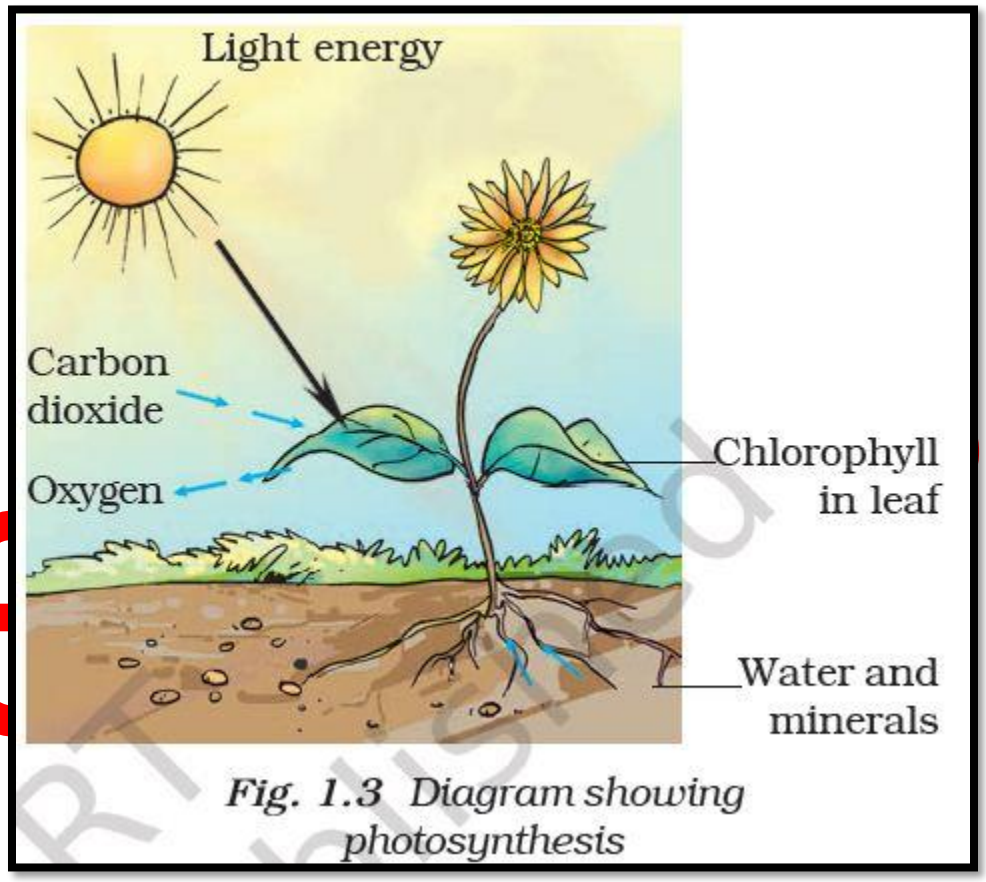


Fig. 1.3 Diagram showing photosynthesis

6. Fill in the blanks:

(a) Green plants are called Autotrophs since they synthesise their own food.

(b) The food synthesised by plants is stored as Starch.

(c) In photosynthesis solar energy is absorbed by the pigment called Chlorophyll.

(d) During photosynthesis plants take in Carbon di oxide and release Oxygen gas.

7. Name the following:

(i) A parasitic plant with yellow, slender and branched stem. Cuscuta

(ii) A plant that is partially autotrophic. Insectivorous Plant

(iii) The pores through which leaves exchange gases. Stomata

8. Tick the correct answer:

(a) Cuscuta is an example of:

(i) Autotroph (ii) parasite (iii) saprotroph (iv) host

Ans (ii) Parasite

(b) The plant which traps and feeds on insects is:

(i) Cuscuta (ii) china rose (iv) pitcher plant (iv) rose

Ans. (iv) Pitcher Plant

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.

Column I	Column II
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. (T/F) F

(ii) Plants which synthesise their food are called saprotrophs. (T/F) F

(iii) The product of photosynthesis is not a protein. (T/F) T

(iv) Solar energy is converted into chemical energy during photosynthesis. (T/F) 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) Stomata

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) Leaves

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

Ans.

Farmers grow many fruits and vegetable crops inside large green houses because it provide suitable climate for the growth of crop and reduce the chances of spoilage of crop due to adverse climatic condition.

Advantage of Green House to Farmers

1. **It provide suitable climate for the growth of crop.**
2. **Reduce the chances of spoilage of crop.**
3. **Protection of crops against disease, pest etc.**
4. **Production even in off seasons**

Chapter 2
Nutrition in Animals

1. Fill in the blanks:

(a) The main steps of nutrition in humans are ingestion, digestion, absorption, assimilation and egestion.

(b) The largest gland in the human body is liver.

(c) The stomach releases hydrochloric acid and digestive juices which act on food.

(d) The inner wall of the small intestine has many finger-like outgrowths called villi.

(e) Amoeba digests its food in the food vacuole.

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

(a) Digestion of starch starts in the stomach. (T/F) F

(b) The tongue helps in mixing food with saliva. (T/F) T

(c) The gall bladder temporarily stores bile. (T/F) T

(d) The ruminants bring back swallowed grass into their mouth and chew it for some time. (T/F) 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

Ans (iii) Small intestine

(b) Water from the undigested food is absorbed mainly in the

(i) Stomach (ii) food pipe (iii) small intestine (iv) large intestine

Ans. (iv) Large intestine

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.

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

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

Ans.

The inner walls of the small intestine have thousands of finger-like outgrowths. These are called villi. The villi increase the surface area for absorption of the digested food. Each villus has a network of thin and small blood vessels close to its surface. The surface of the villi absorbs the digested food materials.

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

Ans.

The liver produces bile juice that is stored in a sac called the gall bladder. The bile plays an important role in the digestion of fats.

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

Ans.

Carbohydrate that can be digested by ruminants but not by humans is cellulose. Many animals, including humans, cannot digest cellulose. The cellulose of the food is digested by the action of certain bacteria which are not present in humans.

8. Why do we get instant energy from glucose?

Ans.

Glucose is the simplest carbohydrate that can be broken easily to give a high energy molecule that provides energy for cells and the bloodstream by which we get instant energy.

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

(i) Absorption of food: - Small intestine.

(ii) Chewing of food: - buccal cavity.

(iii) Killing of bacteria: - Stomach.

(iv) Complete digestion of food: - Small intestine.

(v) Formation of faeces: - Large intestine

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

Ans.

Similarities

In amoeba, digestive juices are secreted into the food vacuole. They act on the food and break it down into simpler substances. Gradually the digested food is absorbed. Similarly, in human beings various digestive juices act on food and break it down into simpler substances.

Difference

Amoeba ingests its food with the help of its false feet or pseudopodia. The food is digested in the food vacuole. The undigested residue of the food is expelled outside by the vacuole. In human Being, We take in food through the mouth, digest and utilise it. The unused parts of the food are defecated.

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.

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

12. Label Fig. 2.11 of the digestive system

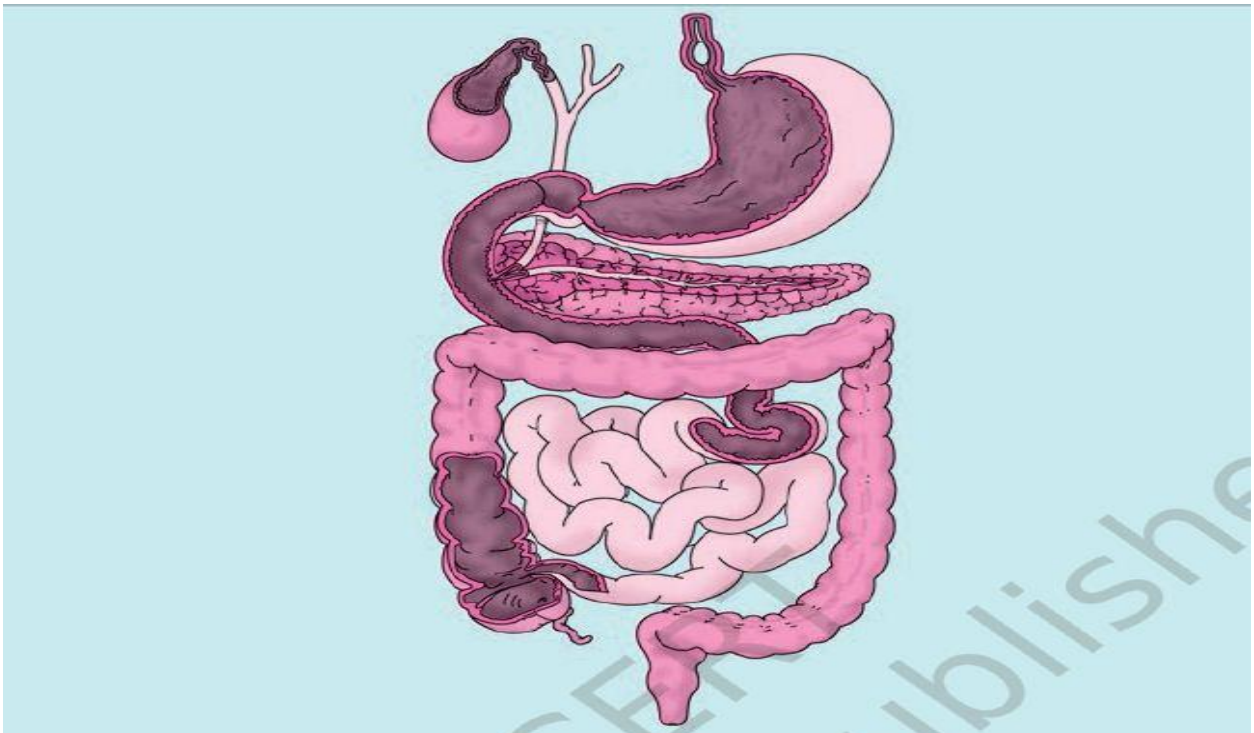
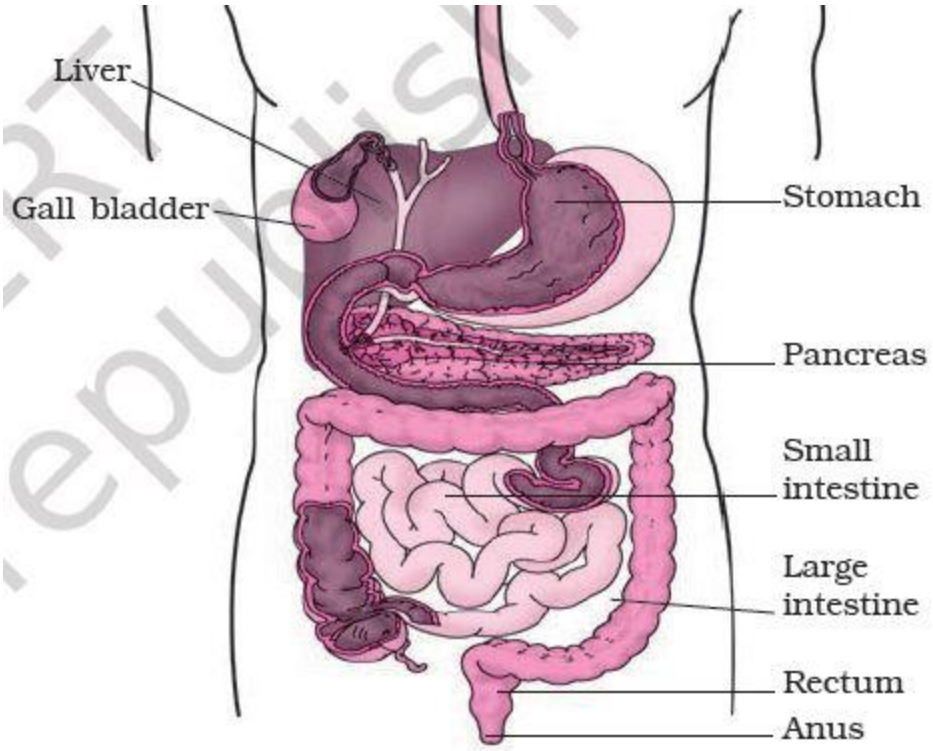


Fig. 2.11 A part of human digestive system

Ans.



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

Ans.

No, we cannot survive only on raw, leafy vegetables / grass because raw leafy vegetables contains cellulose which cannot be digested by human being due to absence of cellulose digesting enzymes in our body.

Chapter 3

Heat

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

Ans.

Similarities between laboratory thermometer and Clinical thermometer

- **Both are made of glass.**
- **Both have long narrow glass tube.**
- **Both of them have a bulb at one end.**
- **The bulbs of both consist of mercury.**
- **Both thermometers have celsius scale.**

Comparison between Clinical Thermometer and Laboratory Thermometer

(i) The clinical thermometer has a very short temperature range (35°C to 42°C) whereas a laboratory thermometer has a large temperature range (usually from, -10°C to 110°C).

(ii) The clinical thermometer has a kink (or constriction) in its tube to prevent the back flow of mercury into the bulb whereas a laboratory thermometer has no kink.

(iii) The clinical thermometer measures temperature more accurately (up to 0.1°C) than a laboratory thermometer.

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

Ans.

Aluminum, iron and copper are the example of Conductors of heat.

Plastic, wood, paper, cloth, leather, cotton, wool are poor conductors of heat or insulator of heat.

3. Fill in the blanks:

(a) The hotness of an object is determined by its temperature.

(b) Temperature of boiling water cannot be measured by a Clinical thermometer.

(c) Temperature is measured in degree Celsius.

(d) No medium is required for transfer of heat by the process of Radiation.

(e) A cold steel spoon is dipped in a cup of hot milk. Heat is transferred to its other end by the process of conduction.

(f) Clothes of light colours absorb more heat better than clothes of light colours.

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

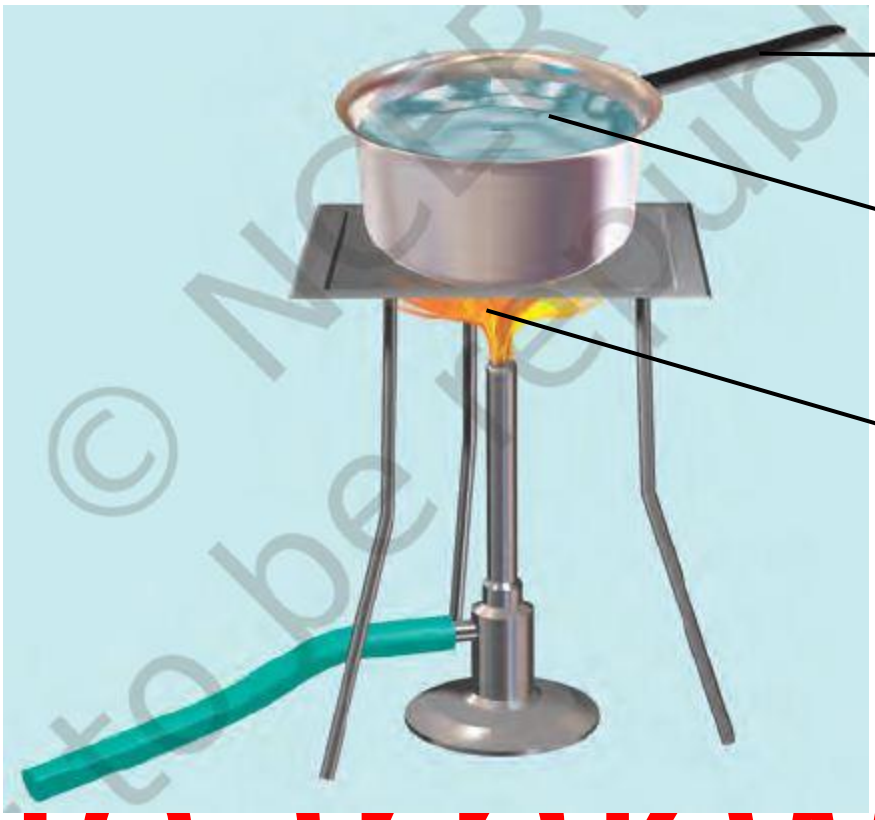
5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing.

Ans.

Wearing more layers of clothing will keep us warm in winters as they have a lot of space between them. This space gets filled with air. Air does not allow the body heat to escape out.

Que6. Look at Fig. 3.13. Mark where the heat is being transferred by conduction, by convection and by radiation. Fig.

Ans.



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

Ans.

Light colour reflect most of the heat that falls on them.

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) Between 30°C and 50°C

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) Not flow from iron ball to water or from water to iron ball.

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) does not become cold.

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

Chapter 4

Acids, Bases and Salts

1. State differences between acids and bases.

Ans.

Acids	Bases
1. Acids have sour taste.	1. Bases have bitter taste.
2. Acids are not soapy to touch.	2. Bases feel soapy to touch.
3. Acids turn blue litmus to red.	3. Bases turn red litmus to blue.

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 is a natural indicator. Which is extracted from the type of plant called 'lichen'. Litmus is the most common indicator for testing acids and bases in the laboratory.

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

Ans.

Distilled water is neutral substance. That means it is neither acidic nor basic in nature. They do not change the colour of any indicator.

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

Ans.

The reaction in which an acid reacts with a base to form salt and water is called neutralization.

A neutralisation reaction can be represented as:

Acid + Base $\longrightarrow$ Salt + Water

Milk of magnesia contains a base called magnesium hydroxide. Another antacid is baking soda. Baking soda contains a base called sodium hydrogen carbonate.

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

(i) Nitric acid turn red litmus blue. (T/F) F

(ii) Sodium hydroxide turns blue litmus red. (T/F) F

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

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

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

Dorji can decide which drink is to be served to whom with the help of litmus paper:
(i) The drink that turn a red litmus blue would be basic.
(ii) The drink that turns a blue litmus to red would be acidic.
(iii) The drink which doesn't show any change on red and blue litmus would be neutral.

8. Explain why:

(a) An antacid tablet is taken when you suffer from acidity.

Ans.

Antacids are a group of mild bases which have no toxic effects on the body. Being basic in nature, antacids react with excess acid in the stomach and neutralise it.

(b) Calamine solution is applied on the skin when an ant bites.

Ans.

The sting of an ant contains an acid called formic acid. If an ant stings a person, then rubbing a mild base like baking soda solution (or calamine solution) on the stung area of the skin gives relief. This is because, being a base, baking soda solution (or calamine solution) neutralises the acidic liquid injected by the ant and cancels its effect

(c) Factory waste is neutralised before disposing it into the water bodies.

Ans.

The waste substances discharged by many factories contain acids. If these untreated factory wastes are discharged into water bodies, then the acids present in them will kill the fish and other aquatic organisms which live in the water bodies. The acidic factory wastes should be treated with basic substances to neutralise them before discharging them into water bodies.

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.

1. Hydrochloric acid turn Yellow to blue
2. Sodium hydroxide turn Yellow to red
3. Sugar solution No change

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

Ans.

Blue litmus paper dipped in a solution if it remains blue then the solution is neutral solution.
Those substances which are neither acidic nor basic in nature are called neutral substances. Neutral substances do not change the colour of any indicator.

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.

(ii) a and d

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) Photosynthesis - Chemical Change

(b) Dissolving sugar in water – Physical Change

(c) Burning of coal - Chemical Change

(d) Melting of wax – Physical Change

(e) Beating aluminium to make aluminium foil – Physical Change

(f) Digestion of food - 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. (True/False)

Ans.

False, Cutting of wood into piece is a physical as well as irreversible change.

(b) Formation of manure from leaves is a physical change. (True/False)

Ans.

Formation of manure from leaves is a chemical change.

(c) Iron pipes coated with zinc do not get rusted easily. (True/False)

Ans.

True

(d) Iron and rust are the same substances. (True/False)

Ans.

Iron and rust are two different chemical substance.

(e) Condensation of steam is not a chemical change. (True/False)

Ans.

True

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 **Calcium Carbonate**.

(b) The chemical name of baking soda is **Sodium hydrogen carbonate**.

(c) Two methods by which rusting of iron can be prevented are **Painting or greasing** and **galvanisation**.

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

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

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.

When baking soda is mixed with lemon juice, following reaction will take place: -

Lemon juice (citric acid) + Baking soda (Sodium hydrogen carbonate) = CO_2 (Carbon dioxide) + other substances

It's a chemical change.

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, both physical and chemical changes take place:

(i) Physical change: melting of wax, vapourisation of melted wax.

(ii) Chemical change: Burning of vapours of wax to give carbon dioxide, heat and light.

LPG is another example for both physical and chemical change.

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

Ans.

The setting of curd is a chemical change because curd can't be reversed back to milk again. Secondly properties of milk and curd are different.

7. Explain why burning of wood and cutting it into small pieces areconsidered as two different types of changes.

Ans.

Burning of wood is a chemical change as if after burning two new substance are formed i.e., smoke and ash. Hence the properties of wood are changed. So, it's a chemical change. Cutting of wood is a physical change as if small pieces of wood bears the same properties of wood and there is no new substance formed.

8. Describe how crystals of copper sulphate are prepared.

Ans.

Take a cupful of water in a beaker and add a few drops of dilute sulphuric acid. Heat the water. When it starts boiling add copper sulphate powder slowly while stirring continuously. Continue adding copper sulphate powder till no more powder can be dissolved. Filter the solution. Allow it to cool. Do not disturb the solution when it is

cooling. Crystal of copper sulphate will slowly formed at the bottom of the beaker. That is how crystal of copper sulphate can be prepared.

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

Ans.

Rusting of Iron Gate can be prevented by painting. When a coat of paint is applied the surface of an iron object, then air and moisture cannot come in contact with the iron object and hence no rusting takes place.

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

Ans.

There are two conditions are necessary for the rusting of iron to take place:

(i) presence of oxygen (of air), and

(ii) presence of water or water vapour (called moisture).

When iron metal combines with the oxygen (of air) in the presence of water (moisture) to form a compound iron oxide. In coastal area presence of moisture or water vapour is more than in desert area.

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) Process – B is a chemical change

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) Both processes A and B are chemical changes.

Chapter 6

Respiration in Organisms

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

Ans.

During heavy exercise, fast running, cycling, walking for many hours or heavy weight lifting, the demand for oxygen is high. So, an athlete needs to breathe faster and deeper than usual after finishing the race.

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

Ans.

In the cell, the food (glucose) is broken down into carbon dioxide and water using oxygen. When breakdown of glucose occurs with the use of oxygen it is called aerobic respiration. Breakdown of food releases energy.

$$\text{Glucose} \xrightarrow[\text{of Oxygen}]{\text{In the presence}} \text{Carbon dioxide} + \text{Water} + \text{Energy}$$

Food can also be broken down, without using oxygen. This is called anaerobic respiration. There are some organisms such as yeast that can survive in the absence of air. They are called anaerobes. They get energy through anaerobic respiration. In the absence of oxygen, glucose breaks down into alcohol and carbon dioxide, as given below:

$$\text{Glucose} \xrightarrow[\text{of Oxygen}]{\text{In the Absence}} \text{Alcohol} + \text{Carbon dioxide} + \text{Energy}$$

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

Ans.

The air we inhale contains various types of unwanted particles like smoke, dust, pollen, etc. During inhalation, these particles get trapped in the hair present in our nasal cavity. They cause irritation in the lining of the nasal cavity, as a result of which we sneeze.

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 had higher concentration of CO_2 then Test tube B and C. Because Snail exhale out CO_2 in the test tube which increases concentration of CO_2 in test tube A. While in Test tube B and C Plant inhale CO_2 which reduces concentration of CO_2 in these test tubes.

5. Tick the correct answer:

(a) In cockroaches, air enters the body through

(i) lungs (ii) gills (iii) spiracles (iv) skin

Ans.

(iii) Spiracles

(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

Ans.

(ii) Lactic Acid

(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

Ans.

(ii) 15 - 18

(d) During exhalation, the ribs

(i) move outwards (ii) move downwards (iii) move upwards (iv) do not move at all

Ans.

(ii) Move Downward

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.

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

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. (T/F) False

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

(iii) Frogs breathe through their skins as well as their lungs. (T/F) True

(iv) The fishes have lungs for respiration. (T/F) False

(v) The size of the chest cavity increases during inhalation. (T/F) True

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

Ans.

Trachea

(ii) Skeletal structures surrounding chest cavity

Ans.

Ribs

(iii) Muscular floor of chest cavity

Ans.

Diaphragm

(iv) Tiny pores on the surface of leaf

Ans.

Stomata

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

Ans.

Spiracles

(vi) The respiratory organs of human beings

Ans.

Lungs

(vii) The openings through which we inhale

Ans.

Nostrils

(viii) An anaerobic organism

Ans.

Yeast

(ix) An organism with tracheal system

Ans.

Ant

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

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.

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

2. Fill in the blanks.

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

(ii) Haemoglobin is present in red blood **cells.**

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

(iv) The rhythmic expansion and contraction of the heart is called heartbeat.

(v) The main excretory product in human beings is Urea.

(vi) Sweat contains water and salt.

(vii) Kidneys eliminate the waste materials in the liquid form called Urine.

(viii) Water reaches great heights in the trees because of suction pull caused by Transpiration.

3. Choose the correct option:

(a) In plants, water is transported through

(i) xylem (ii) phloem (iii) stomata (iv) root hair

Ans.

(i) Xylem

(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.

(iii) Under the fan

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

Ans.

Transport of materials is necessary in a plant or in an animal because it provide necessary nutrient to plant and animal.

All organisms need food, water and oxygen for survival. They need to transport all these to various parts of their body. Blood transports substances like digested food from the small intestine to the other parts of the body. It carries oxygen from the lungs to the cells of the body. It also transports waste for removal from the body.

Plants absorb water and minerals by the roots. Xylem and phloem transport substances in plants.

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

Ans.

Platelet prevents the loss of blood due to bleeding. If there are no platelets, the blood will not be able to clot and keep on flowing. Huge loss of blood will ultimately cause death.

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

Ans.

Stomata are the tiny pores found on the surface of the leaves of plants. The opening and closing of the stomata controls the passage of gases and water vapour into and out of the leaf.

Function of stomata

1. The stomata allow the gases to move in and out of the leaf.
2. Water vapour passes out through stomata during transpiration.

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

Ans.

1. The process of transpiration serves a very useful function in the plants because it generates a suction force in xylem which can pull water from the roots up to great height in the tall trees.

2. Another function of transpiration is that it cools the plant in hot weather.

8. What are the components of blood?

Ans.

The Components of blood are red blood cells, white blood cells, platelets and plasma.

- **Blood is composed of fluid, called plasma in which different types of cells are suspended.**
- **One type of cells is the red blood cells (RBC) which contain a red pigment called haemoglobin. Haemoglobin binds with oxygen and transports it to all the parts of the body and ultimately to all the cells.**
- **The blood also has white blood cells (WBC) which fight against germs that may enter our body.**
- **The clot is formed because of the presence of another type of cells in the blood, called platelets. Platelets prevent the loss of blood due to bleeding.**

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

Ans.

1. Blood carries digested food, water and oxygen to all the parts of the body.

2. It also takes away waste product like carbon dioxide made in the body cell.

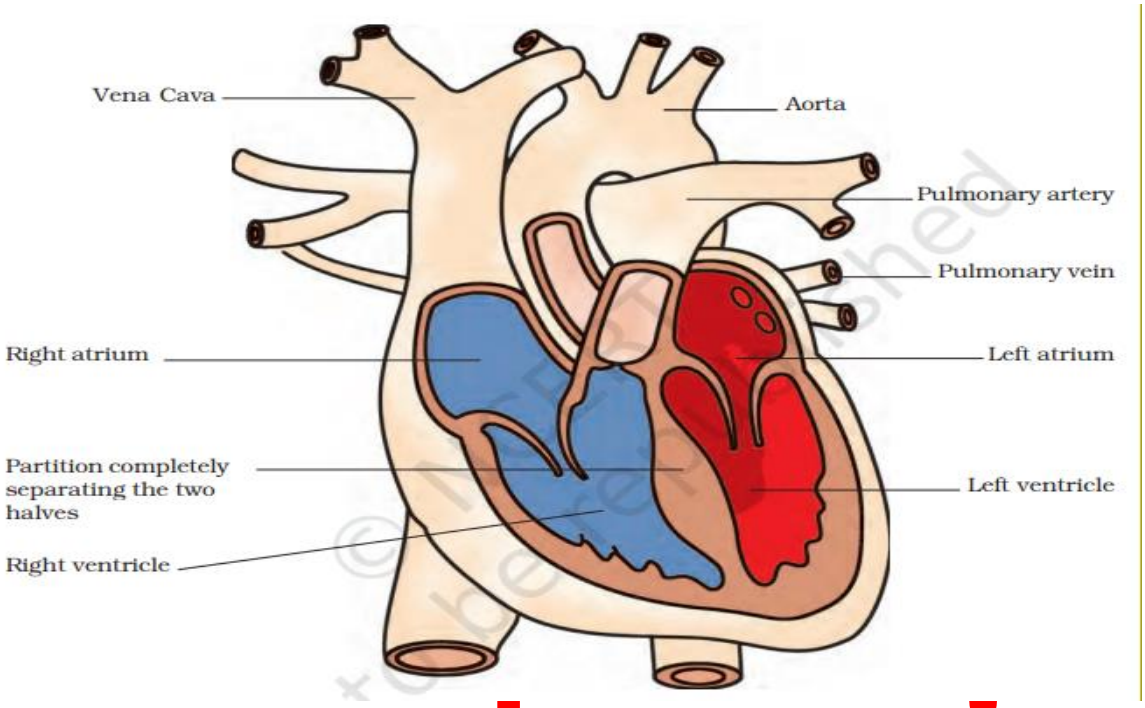
10. What makes the blood look red?

Ans.

It is the presence of haemoglobin which makes blood appears red.

11. Describe the function of the heart.

Ans.



The heart is an organ which beats continuously to act as a pump for the transport of blood, which carries other substances with it.

The heart has four chambers. The two upper chambers are called the atria (singular: atrium) and the two lower chambers are called the ventricles. The right side of the heart carries deoxygenated blood while the left side of the heart carries oxygenated blood. The partition between the chambers is called septum which helps to avoid mixing up of blood rich in oxygen with the blood rich in carbon dioxide.

12. Why is it necessary to excrete waste products?

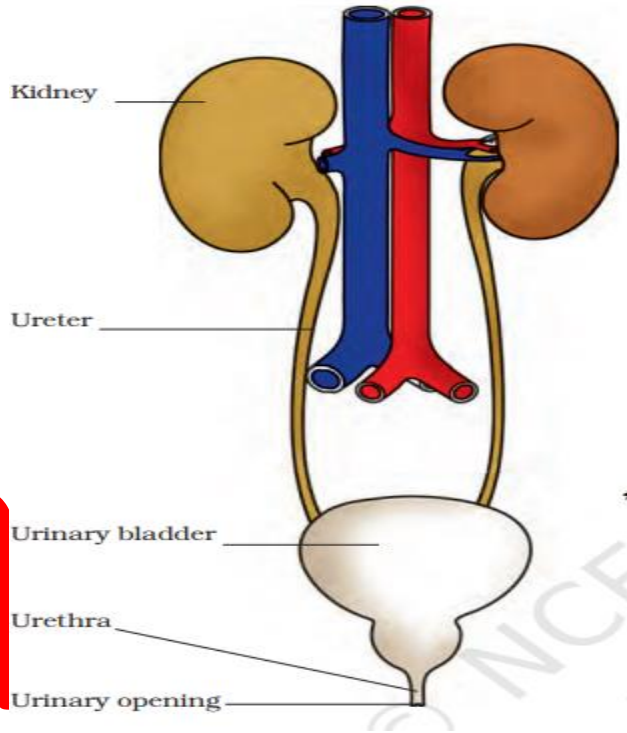
Ans.

When our cells perform their functions, certain waste products are released. These are toxic and hence need to be removed from the body.

The process of removal of wastes produced in the cells of the living organisms is called excretion. The parts involved in excretion form the excretory system.

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

Ans.



Chapter 8

Reproduction in Plants

1. Fill in the blanks:

(a) Production of new individuals from the vegetative part of parent is called Vegetative Propagation.

(b) A flower may have either male or female reproductive parts. Such a flower is called Unisexual flower.

(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 Pollination.

(d) The fusion of male and female gametes is termed as Fertilization.

(e) Seed dispersal takes place by means of Wind, Water **and** Animal.

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

Ans.

Vegetative propagation

It is a type of asexual reproduction in which new plants are produced from roots, stems, leaves and buds. Since reproduction is through the vegetative parts of the plant, it is known as vegetative propagation.

Budding

The small bulb-like projection coming out from the yeast cell is called a bud. The bud gradually grows and gets detached from the parent cell and forms a new yeast cell.

Fragmentation

Algae that present in water bodies reproduce by Fragmentation. When water and nutrients are available algae grow and multiply rapidly by fragmentation. An alga breaks up into two or more fragments. These fragments or pieces grow into new individuals.

Spore formation

The fungi on a bread piece grow from spores which are present in the air. Spores are asexual reproductive bodies. Each spore is covered by a hard protective coat to withstand unfavourable conditions such as high temperature and low humidity. So they can survive for a long time. Under favourable conditions, a spore germinates and develops into a new individual. Plants such as moss and ferns also reproduce by means of spores.

3. Explain what you understand by sexual reproduction.

Ans.

The production of new plant from existing plants by the fusion of their gametes is called sexual reproduction. In sexual reproduction in plants, the fusion of male and female gametes leads to the formation of seeds. The seeds can then germinate to form plants. Most of the flowering plants produced by sexual reproduction.

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

Ans.

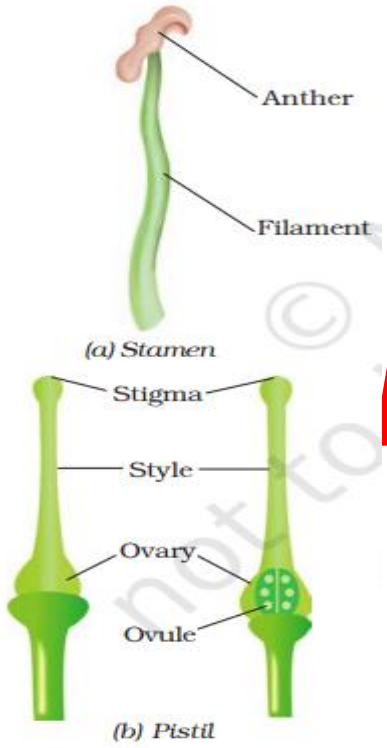
The basic difference between asexual and sexual reproduction in plant is that:

i) In Asexual reproduction, new plants are produced without seeds.

ii) In sexual reproduction, new plants are produced from seeds.

5. Sketch the reproductive parts of a flower.

Ans.



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

Ans.

If the pollen grain from the anther of flower lands on the stigma of the same flower or another flower of the same plant, it is called self-pollination.

When the pollen grain from the anther of a flower lands on the stigma of a flower of a different plant of the same kind, it is called cross-pollination.

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

Ans.

The process in which the male gametes present in the pollen grain fuses with the female gametes present in ovule to form a new cell called zygote is called fertilization. Fertilised egg cell called zygote. Zygote developed into an embryo. Embryo is that part of a seed which developed into a new plant.

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

Ans.

Seeds and fruits of plants are carried away by wind, water and animals.

Winged seeds such as those of drumstick and maple, light seeds of grasses or hairy seeds of aak (Madar) and hairy fruit of sunflower, get blown off with the wind to faraway places.

Some seeds are dispersed by water. These fruits or seeds usually develop floating ability in the form of spongy or fibrous outer coat as in coconut.

Some seeds are dispersed by animals, especially spiny seeds with hooks which get attached to the bodies of animals and are carried to distant places. Examples are Xanthium and Urena.

Some seeds are dispersed when the fruits burst with sudden jerks. The seeds are scattered far from the parent plant. This happens in the case of castor and balsam.

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.

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

10. Tick the correct answer:

(a) The reproductive part of a plant is the

(i) leaf (ii) stem (iii) root (iv) flower

Ans.

(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

Ans.

(i) Fertilisation

(c) Mature ovary forms the

(i) seed (ii) stamen (iii) pistil (iv) fruit

Ans.

(iv) Fruit

(d) A spore producing organism is

(i) rose (ii) bread mould (iii) potato (iv) ginger

Ans.

(ii) Bread mould

(e) Bryophyllum can reproduce by its

(i) stem (ii) leaves (iii) roots (iv) flower

Ans.

(ii) Leaves

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.

Ans.

Oscillatory motion

(ii) Motion of a horse pulling a cart on a straight road.

Ans.

Rectilinear motion

(iii) Motion of a child in a merry-go-round.

Ans.

Circular motion

(iv) Motion of a child on a see-saw.

Ans.

Oscillatory motion

(v) Motion of the hammer of an electric bell.

Ans.

Oscillatory motion

(vi) Motion of a train on a straight bridge.

Ans.

Rectilinear motion

2. Which of the following are not correct?

(i) The basic unit of time is second.

Ans.

Correct

(ii) Every object moves with a constant speed.

Ans.

Incorrect

(iii) Distances between two cities are measured in kilometres.

Ans.

Correct

(iv) The time period of a given pendulum is constant.

Ans.

Incorrect

(v) The speed of a train is expressed in m/h.

Ans.

Incorrect

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

Ans.

The time taken by the pendulum to complete one oscillation is called its time period.

$$Time\ period = \frac{Total\ Time\ taken}{No.\ of\ oscillation}$$

$$\frac{32}{20} = 1.6\ second$$

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.

$$Speed\ of\ the\ train = \frac{Distance\ Covered}{Total\ time\ taken}$$

$$\frac{240}{4} = 60km/hr$$

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.

Distance covered by car = 57336 – 57321 = 15km

Time taken between 08:30 AM to 08:50 AM = 20min

(in hr) = $\frac{20}{60} = \frac{1}{3}$

Speed in km/min

$$Speed\ = \frac{Distance\ Covered}{Total\ time\ taken}$$

$$\frac{15km}{20min} = 0.75km/min$$

Speed in km/hr

$$Speed\ = \frac{Distance\ Covered}{Total\ time\ taken}$$

$$\frac{15km}{\frac{1}{3}hr}$$

$$\frac{15\ X\ 3\ km}{1hr} = 45km/hr$$

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.

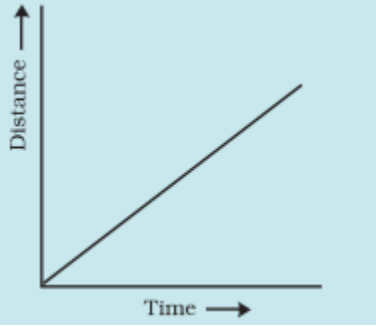
Ans.

Speed of a bicycle = 2m/s
Time taken = 15min
(in sec) = 15 X 60 = 900sec
Distance = Speed X Time = 2 X 900 = 1800m = 1.8km

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

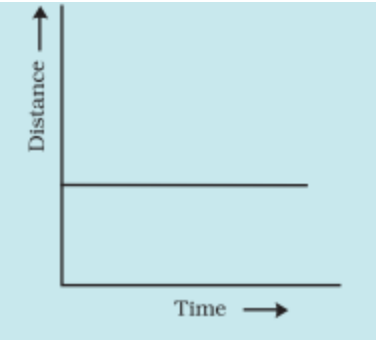
(i) A car moving with a constant speed.

Ans.



(ii) A car parked on a side road.

Ans.



8. Which of the following relations is correct?

(i) Speed = Distance X Time (ii) Speed = $\frac{\text{Distance}}{\text{Time}}$

(iii) Speed = $\frac{\text{Time}}{\text{Distance}}$ (iv) Speed = $\frac{1}{\text{Distance X Time}}$

Ans.

(ii) Speed = $\frac{\text{Distance}}{\text{Time}}$

9. The basic unit of speed is:

(i) km/min (ii) m/min (iii) km/h (iv) m/s

Ans.

(iv) m/s

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.

Earlier,

Speed of a car = 40km/h

Time taken = 15min = $\frac{15}{60} = 0.25\text{h}$

Distance covered = Speed X Time
= 40 X 0.25 = 10km

Now,

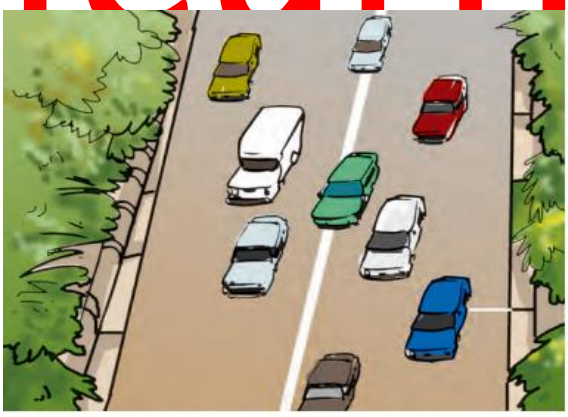
Speed of a car = 60km/h

Time taken = 15min = $\frac{15}{60} = 0.25h$

Distance covered = Speed X Time
= 60 X 0.25 = 15km

Total Distance Covered = 15km=
Answer (iii) 15km

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 1cm in these photographs, calculate the speed of the fastest car.



Ans.

Distance of 100m is shown by 1cm.Distance covered by blue car from one white strips to another is 1cm

Distance covered is 1cm = 1 X 100 = 100m

Time Taken = 10 seconds

Speed $= \frac{\text{Distance}}{\text{Time}} = \frac{100\text{m}}{10\text{s}} = 10\text{m/s}$

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?

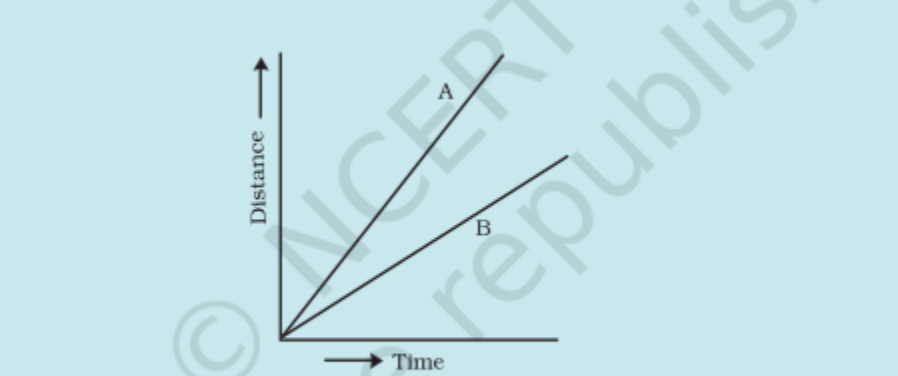
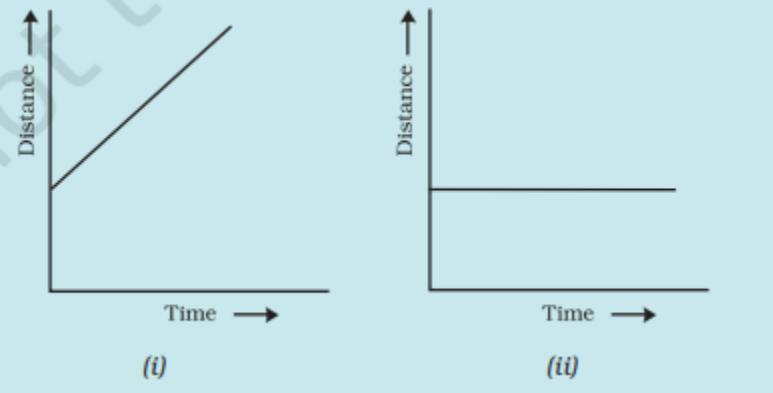


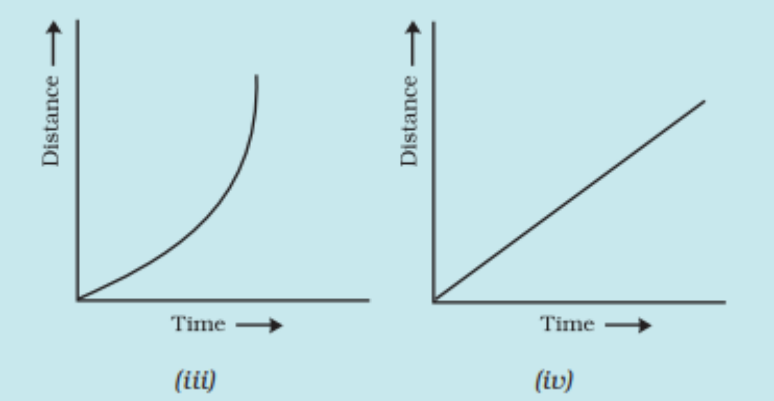
Fig. 9.15 Distance-time graph for the motion of two cars

Ans.

Vehicle A is moving faster than Vehicle B

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



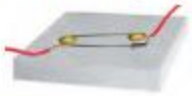
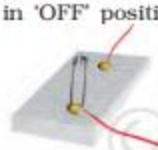


Ans.
(iii)

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.

S.No.	Electric component	Symbol
1.	Electric cell 	
2.	Electric bulb 	
3.	Switch in 'ON' position 	
4.	Switch in 'OFF' position 	
5.	Battery 	
6.	Wire 	

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

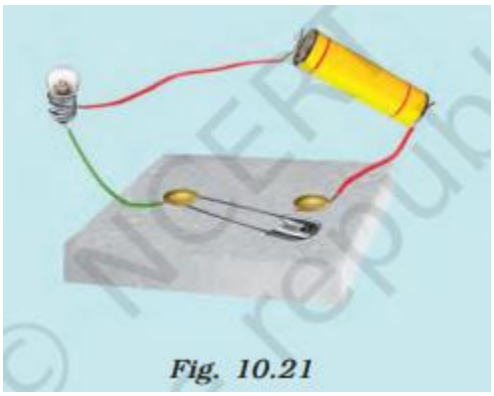
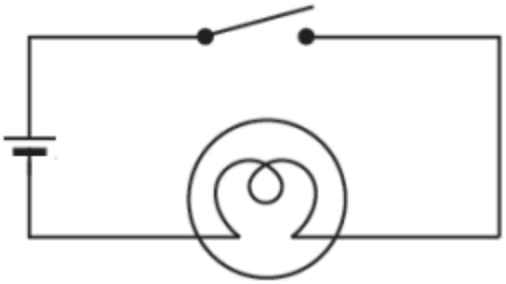


Fig. 10.21

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.

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.

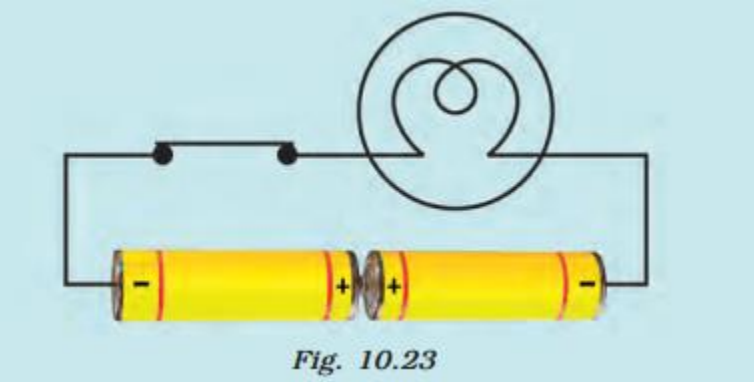


Fig. 10.23

Ans.

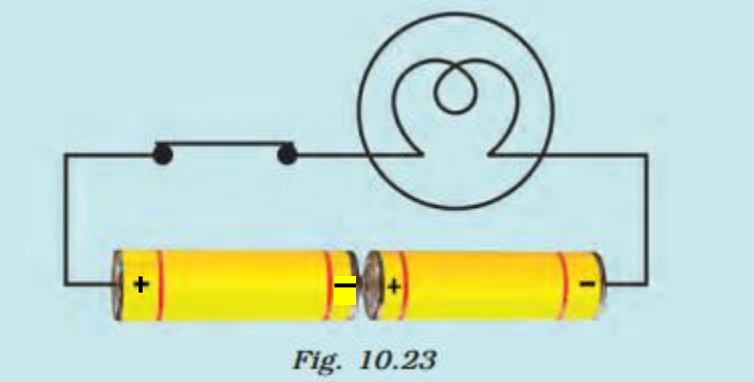


Fig. 10.23

5. Name any two effects of electric current.

Ans.

Two effects of electric current are
(i) Heating Effect
(ii) Magnetic Effect

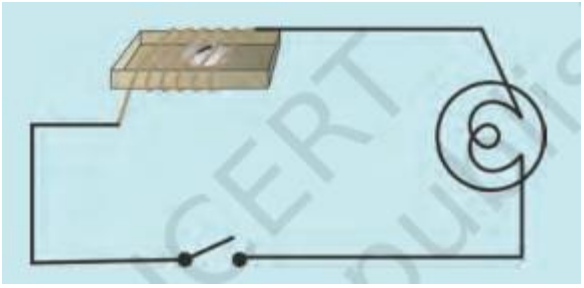
6. When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain.

Ans.

The compass needle gets deflected from north - south position every time when the current was passed through the wire. We know that the needle of a compass is a tiny magnet, which points in north-south

direction. When we bring a magnet close to it, the needle gets deflected.

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



Ans.

No, there is no source of electric current. The compass needle will not show deflection when the switch in the circuit is closed.

8. Fill in the blanks:

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

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

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

(d) The safety device based on the heating effect of electric current is called a 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. (T/F) False

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

(c) An electromagnet does not attract a piece of iron. (T/F) False

(d) An electric bell has an electromagnet. (T/F) True

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

Ans.

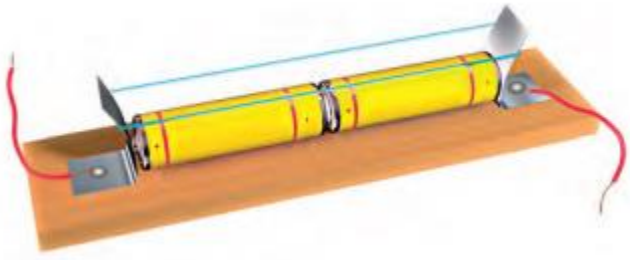
An electromagnet can't be used for separating plastic bags from a garbage heap because plastic bag don't have magnetic property to get attracted to a magnet.

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.

No, it is not possible to replace a fuse by a piece of wire because normal copper wire has a high melting point. High voltage current can flow through this wire without breaking the main circuit which might cause a big accident.

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.

1. Cells is not placed in cell holder properly, i.e., the positive terminal of one cell is not connected to the negative terminal of the next cell.
2. Wire is not properly connected with the two metal chips on the cell holder.
3. Switch might not be working.
4. Bulb is fused.
5. Cell may be used up

13. In the circuit shown in Fig. 10.25

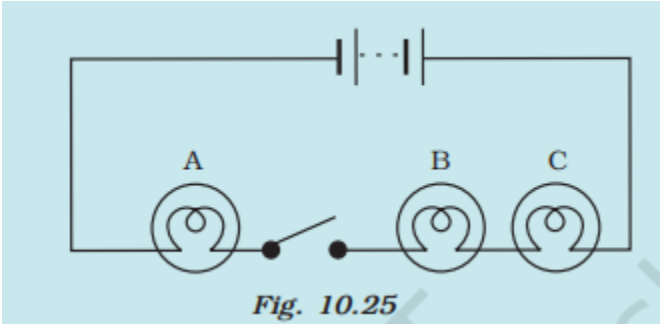


Fig. 10.25

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

Ans.

No, the bulb will not glow when the switch is in 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.

Blubs will glow simultaneously.

Chapter 11

Light

1. Fill in the blanks:

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

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

(c) An image formed by a Plane 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 Real image.

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

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. (T/F) False

(b) A concave lens always forms a virtual image. (T/F) True

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

(d) A real image cannot be obtained on a screen. (T/F) False

(e) A concave mirror always form a real image. (T/F) False

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.

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

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

Ans.

An image formed by a plane mirror is virtual, erect and of the same size as the object.

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.

Letter A, H, I, M, O, T, U, V, W etc. appears exactly like the letter itself.

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

Ans.

An image that cannot be obtained on a screen is called a virtual image. Reflection of light is the best example of virtual image.

7. State two differences between a convex and a concave lens.

Ans.

Convex Lens	Concave lens
Those lenses which feel thicker in the middle than at the edges are convex lenses.	Those which feel thinner in the middle than at the edges are concave lenses.
A convex lens converges (bends inward) the light generally falling on it. Therefore, it is called a converging lens.	On the other hand, a concave lens diverges (bends outward) the light and is called a diverging lens.

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

Ans.

Doctors using concave mirrors for examining eyes, ears, nose and throat. Concave mirrors are also used by dentists to see an enlarged image of the teeth.

Convex mirrors can form images of objects spread over a large area. So, these help the drivers to see the traffic behind them.

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

Ans.

Concave mirror can form a real image.

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

Ans.

Concave lens always form a virtual image.

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) Concave Mirror

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) 6m

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) 8m/s

Ans.

(iii) 4 m/s

Chapter 12

Forests: Our Lifeline

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

Ans.

1. Micro-organisms play an important role in the forest. Micro-organisms feed upon the dead plant and animal tissues and convert them into a dark coloured substance called humus. From there, these nutrients are again absorbed by the roots of the living plants.

2. The animals also disperse the seeds of certain plants and help the forest to grow and regenerate. The decaying animal dung also provides nutrients to the seedlings to grow.

3. Larger number of herbivores means increased availability of food for a variety of carnivores. The wide variety of animals helps the forest to regenerate and grow.

2. Explain how forests prevent floods.

Ans.

Forest absorbs lots of water. Roots of trees prevent water from flowing away. This helps in preventing flood.

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

Ans.

The micro-organisms which convert the dead plants and animals to humus are known as decomposers. Examples of Micro-organism are bacteria and fungi. The presence of humus ensures that the nutrients are released into the soil. They help in recycling of waste in a forest.

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

Ans.

Plants in the forest take in carbon dioxide and releases oxygen during the process of photosynthesis. This helps the forest in maintaining balance between oxygen and carbon dioxide in the atmosphere.

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

Ans.

There is no waste in forest because decomposers convert dead bodies of plant and animals into humus and released into the soil. In this way, the nutrients are cycled. So, nothing goes waste in a forest.

6. List five products we get from forests?

Ans.

Forests are the source of medicines, timber spices, gums, fodder for animals and many other useful products.

7. Fill in the blanks:

(a) The insects, butterflies, honeybees and birds help flowering plants in pollination.

(b) A forest is a purifier of Air **and** water.

(c) Herbs form the lowest layer in the forest.

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

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

Ans.

1. If forests disappear, the amount of carbon dioxide in air will increase, resulting in the increase of earth's temperature.

2. In the absence of trees and plants, the animals will not get food and shelter.

3. In the absence of trees, the soil will not hold water, which will cause floods.

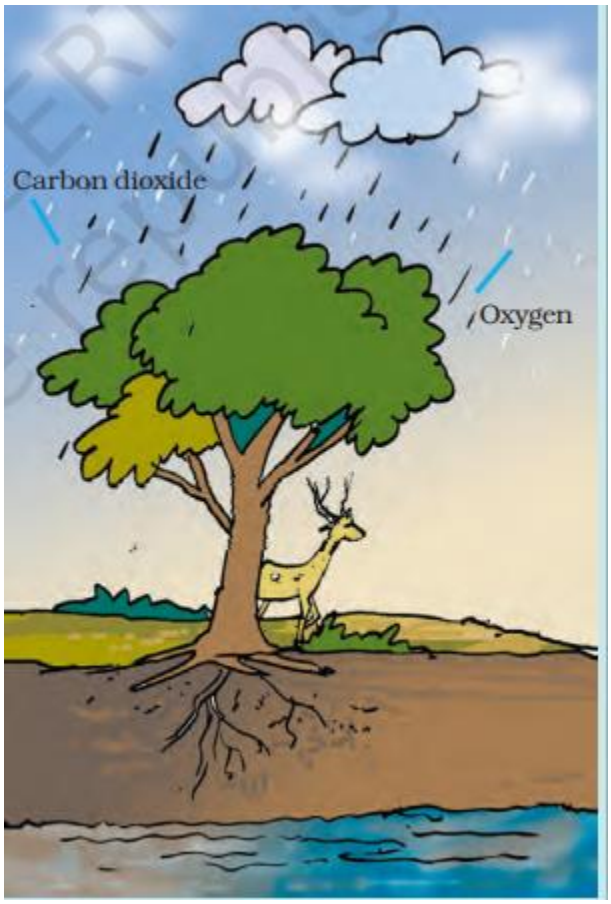
4. Deforestation will endanger our life and environment.

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

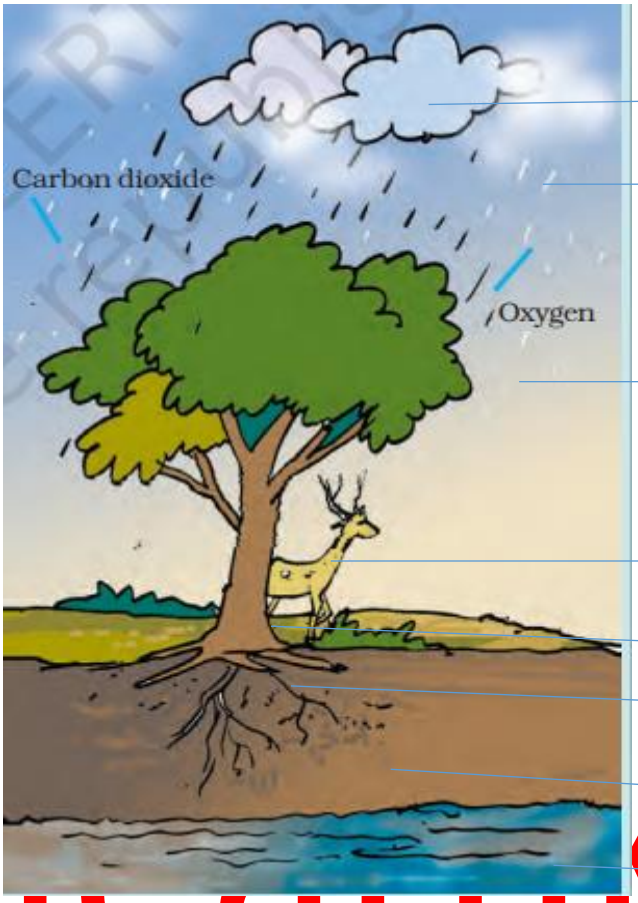
Ans.

The wide variety of plants and animals helps the forest to regenerate and grow. The animals disperse the seeds of certain plants and help the forest to grow and regenerate. By harbouring greater variety of plants, the forest provides greater opportunities for food and habitat for the herbivores. Larger number of herbivores means increased availability of food for a variety of carnivores. Decomposers feed upon the dead plant and animal and convert them into humus which helps in maintaining the supply of nutrients to the growing plants in the forest. This made forest a 'dynamic living entity'.

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.



Ans.



Clouds

Rain

Atmosphere

Animal

Plant

Roots

Soil

Water Table

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

(i) Gum (ii) Plywood (iii) Sealing wax (iv) Kerosene

Ans.

(iv) Kerosene

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

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

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

Ans.

(iii) humus

Chapter 13

Wastewater Story

1. Fill in the blanks:

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

(b) Wastewater released by houses is called Sewage.

(c) Dried sludge is used as manure.

(d) Drains get blocked by Cooking oil and fats.

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

Ans.

Sewage is wastewater released by homes, industries, hospitals, offices and other users. Untreated waste should not be discharge into rivers and streams as it contains harmful pollutant and microorganism which can contaminate water bodies. Drinking contaminated water is the cause of a large number of diseases.

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

Ans.

Cooking oil and fats should not be thrown down the drain. They can harden and block the pipes.

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

Ans.

(i) In the first stage, waste water is passed through rotating screens to remove large objects like rags, sticks, cans, plastics, napkins, etc.

(ii) The water is then passed through a grit and sand tank to remove small stones and pebbles. The liquid material is then passed through huge sedimentation tanks

(iii) The solid wastes such as faeces settle down at the bottom of the tank and are removed with the help of a scraper. This is sludge.

Light materials float on top is removed with the help of a skimmer.

(iv) The clarified water then moves on to the secondary treatment stage. It involves pumping of air into the clarified water to help aerobic bacteria to grow. The bacteria decompose the suspended waste present in this clarified water.

(v) The water is disinfected with chemicals like chlorine or may be exposed to ultraviolet rays to kill disease-causing organisms. It can also be treated with ozone gas. The water is then discharged into the distribution system.

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

Ans.

Solids like faeces settle at the bottom and are removed with a scraper. This is the sludge. A skimmer removes the floatable solids like oil and grease. The sludge is transferred to a separate tank where it is decomposed by the anaerobic bacteria. The biogas produced in the process can be used as fuel or can be used to produce electricity.

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

Ans.

An untreated human excreta is a health hazard. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tube wells,

springs and many rivers. Thus, it becomes the most common route for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

7. Name two chemicals used to disinfect water.

Ans.

Chlorine and ozone are the two chemicals to disinfect water.

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

Ans.

Function of Bar screen in a wastewater treatment plant is to remove large objects like rags, sticks, cans, plastic packets, napkins.

9. Explain the relationship between sanitation and disease.

Ans.

Sanitation and disease are both interrelated. Sanitation means proper disposal of waste from houses and public places. Poor sanitation is the cause of a large number of diseases. Sanitation is must to prevent diseases.

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

Ans.

We all have a role to play in keeping our environment clean and healthy. We must realise your responsibility in maintaining the water sources in a healthy state.

Adopting good sanitation practices should be our way of life.

Influence others with your energy, ideas and optimism.

If you notice some problem in the sewage system you should report it to municipality.

Keep our surrounding clean. Open drains should be kept covered.

Cooking oil and fats should not be thrown down the drain.

Chemicals like paints, solvents, insecticides, motor oil, medicines may kill microbes that help purify water. So do not throw them down the drain.

Used tealeaves, solid food remains, soft toys, cotton, sanitary towels, etc. should also be thrown in the dustbin.

11. Here is a crossword puzzle: Good luck!

Ans.

					1 W						
					A					2 S	
					3 S	E	W	A	G	E	
					T					W	
4 S	L	U	D	G	E		5 B			E	
					W		A			R	
					A		C				
	6 S	A	N	I	T	A	T	I	7 O	N	
					E		E		Z		
					R		R		O		
							I		N		
	8 E	X	C	R	E	T	A		E		

Across

3. Liquid waste products Sewage

4. Solid waste extracted in sewage treatment Sludge

6. A word related to hygiene Sanitation

8. Waste matter discharged from human body Excreta

Down

1. Used water Wastewater

2. A pipe carrying sewage Sewer

5. Micro-organisms which causes cholera Bacteria

7. A chemical to disinfect water 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) (b) and (c)

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