SCIENCE 8

(NCERT TEXTBOOK SOLUTION)

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Chapter 1.
Crop Production and Management

1. Select the correct word from the following list and fill in the blanks.

float, water, crop, nutrients, preparation

(a) The same kind of plants grown and cultivated on a large scale at a place is called _____.
(b) The first step before growing crops is _____ of the soil.
(c) Damaged seeds would _____ on top of water.
(d) For growing a crop, sufficient sunlight and _____ and _____ from the soil are essential.

Ans. (a) crop (b) preparation (c) float (d) water; nutrients

2. Match items in column A with those in column B.

A	B
(i) *Kharif* crops	**(a) Food for cattle**
(ii) *Rabi* crops	**(b) Urea and super phosphate**
(iii) Chemical fertilisers	**(c) Animal excreta, cow dung, urine and plant waste**
(iv) Organic manure	**(d) Wheat, gram, pea**
	(e) Paddy and maize

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

3. Give two examples of each.
(a) *Kharif* crop
(b) *Rabi* crop

Ans. (a) Paddy, maize (b) Wheat, gram

4. Write a paragraph in your own words on each of the following.
(a) Preparation of soil
(b) Sowing
(c) Weeding
(d) Threshing

Ans. (a) Seeds germinate in soil. Plants grow and are anchored in the soil. They absorb water and minerals from soil. Therefore, soil preparation is necessary for the growth of healthy and bumper crop. Soil preparation involves ploughing and levelling of soil. Ploughing loosens the soil which allows easy and deeper penetration of the roots.

(b) Sowing is the process of putting seeds in the soil. Seeds should be sown in moist soil at optimum time and season, and at proper depth. There should be sufficient spacing between the seeds. The seeds sown too deep may fail to germinate due to lack of water or nonavailability of oxygen.

There are two methods of sowing seeds: Manual method or Broadcasting and mechanical method. Manual Method or Broadcasting involves scattering of seeds by hand. Seeds are later covered with soil by leveller to avoid wastage. Seeds of Maize, Wheat, Berseem and Bajra are sown by this method. This results in unequal distribution and wastage of seeds. Mechanical Method involves the use of a seed drill. The seed drill makes furrows in the soil and seeds fall into the furrows at regular distance and at proper depth.

(c) The unwanted plants that grow naturally along with crop plants are called weeds. The removal of weeds from the field without harming the crop plants is called weeding. Weeding is essentially needed because weeds compete with the crop plants for nutrients, water, sunlight and space, and affect their growth badly. They may produce toxic substances that interfere with the growth of crop plants, and thus affect the harvest. They may be poisonous to humans and domestic animals. Also, they attract pests and spread them to the crop plants.

Weeding is done either by pulling out the weeds by hand or removing them with the help of harrow or rake, trowel or hoe or by using chemicals called weedicides. Some natural enemies of weeds are released in the field which feed on weeds and destroy them. For example, cochineal insect is used to eliminate prickly pear (*Opuntia*) from the crop fields in Tamil Nadu.

(d) The process of separating grains from husk is called threshing. It can be done manually and by using animals or machines. In manual threshing, harvested crop is threshed by striking against a hard surface. For threshing with animals, the harvested crop is heaped on the ground and animals like oxen, buffaloes, camels, etc., are made to walk over it in a circle. The cattle's feet release the grains from chaff (bhusa). In mechanical threshing, a machine called thresher is used for threshing. The farm machine, combine is used for both harvesting and threshing.

5. Explain how fertilisers are different from manure.

Ans.

Fertilisers	Manures
1. Fertilisers are synthetic chemical compounds.	1. Manures are organic substances.
2. They are manufactured in factories from different chemicals.	2. They are obtained from the decomposition of animals wastes and plant residues by the action of microorganisms.
3. They make the soil nutrient specific and are rich in nutrients.	3. They provide all the nutrients, but are not very rich in nutrients.
4. They do not provide humus.	4. They provide humus to soil.
5. They restore fertility of soil, but spoil soil chemistry.	5. They replenish soil fertility, restore soil texture and make soil porous.
6. They cause water and soil pollution.	6. They do not cause pollution.
7. They are readily soluble in water, hence, absorbed by plants quickly.	7. They are not readily soluble in water, hence, absorbed by plants slowly.

6. What is irrigation? Describe two methods of irrigation which conserve water.

Ans. The process of watering crop plants in the field at different intervals is called irrigation.
The two methods of irrigation that conserve water are:

- **Sprinkler Irrigation:** In this system, perpendicular pipes are laid in the field at regular intervals. These pipes are joined to the main pipeline at one end and have rotating nozzles at the top end. Water is pumped in the main pipe under pressure. It escapes through the rotating nozzles and gets sprinkled over the crop plants.
- **Drip Irrigation:** This system provides water to the plants drop by drop just near the roots. The water is not wasted at all and the plants get regular water supply.

7. If wheat is sown in the *kharif* season, what would happen? Discuss.

Ans. If wheat is sown in the *kharif* season, the seedlings will not grow well due to absence of optimum conditions of temperature and water.

8. Explain how soil gets affected by the continuous plantation of crops in a field.

Ans. Soil supplies mineral nutrients to the plants, which are essential for the growth of plants. Continuous growing of crops in the same field without leaving it uncultivated for some period, makes the soil poorer in certain nutrients and reduces the fertility of soil.

9. What are weeds? How can we control them?

Ans. The unwanted plants that grow naturally with crop plants are called weeds.
Control of weeds:

- **Manual method:** In this method, weeds are uprooted by hand.
- **Mechanical method:** In this method, weeds are removed by using different agricultural implements such as harrow, trowel, hoe, etc.
- **Chemical method:** In this method, weeds are removed by spraying weedicides such as 2, 4-D, MCPA, butachlor and paraquat on the crop plants.
- **Biological method:** In this method, some natural enemies of weeds are released in the crop field which feed on weeds and destroy them. For example, chochineal insect is used to eliminate prickly pear from the crop fields.

10. Arrange the following boxes in proper order to make a flow chart of sugarcane crop production.

Sending crop to sugar factory	**Irrigation**	**Harvesting**	**Sowing**
1	**2**	**3**	**4**
Preparation of soil	**Ploughing the field**	**Manuring**	
5	**6**	**7**	

Ans. 1. Preparation of soil 2. Ploughing the field 3. Sowing 4. Manuring 5. Irrigation 6. Harvesting 7. Sending crop to sugar factory

11. Complete the following word puzzle with the help of clues given below.

Down

1. Providing water to the crops.

2. Keeping crop grains for a long time under proper conditions.

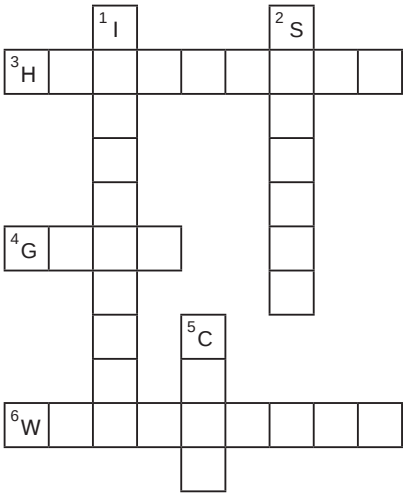
5. Certain plants of the same kind grown on a large scale.

Across

3. A machine used for cutting the matured crop.

4. A rabi crop that is also one of the pulses.

6. A process of separating the grain from chaff.



Ans. Down: 1. IRRIGATION **2.** STORAGE **5.** CROP
Across: 3. HARVESTER **4.** GRAM **6.** WINNOWING

CHAPTER 2.
MICROORGANISMS: FRIEND AND FOE

1. Fill in the blanks.

(a) Microorganisms can be seen with the help of a _____.

(b) Blue green algae fix _____ directly from air and enhance fertility of soil.

(c) Alcohol is produced with the help of _____.

(d) Cholera is caused by _____.

Ans. (a) mircroscope (b) nitrogen (c) yeast (d) bacteria

2. Tick the correct answer.

(a) Yeast is used in the production of
(i) sugar (ii) alcohol (iii) hydrochloric acid (iv) oxygen

(b) The following is an antibiotic
(i) Sodium bicarbonate (ii) Streptomycin (iii) Alcohol (iv) Yeast

(c) Carrier of malaria-causing protozoan is
(i) female *Anopheles* mosquito (ii) cockroach
(iii) housefly (iv) butterfly

(d) The most common carrier of communicable diseases is
(i) ant (ii) housefly (iii) dragonfly (iv) spider

(e) The bread or *idli* dough rises because of
(i) heat (ii) grinding (iii) growth of yeast cells (iv) kneading

(f) The process of conversion of sugar into alcohol is called
(i) nitrogen fixation (ii) moulding (iii) fermentation (iv) infection

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

3. Match the organisms in Column A with their action in Column B.

A	B
(i) Bacteria	**(a) Fixing nitrogen**
(ii) *Rhizobium*	**(b) Setting of curd**
(iii) *Lactobacillus*	**(c) Baking of bread**
(iv) Yeast	**(d) Causing malaria**
(v) A protozoan	**(e) Causing cholera**
(vi) A virus	**(f) Causing AIDS**
	(g) Producing antibodies

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

4. Can microorganisms be seen with the naked eye? If not, how can they be seen?

Ans. (a) No. They can be seen with the help of a microscope.

5. What are the major groups of microorganisms?

Ans. There are 5 major groups of microorganisms: Bacteria, Fungi, Algae, Protozoa, Viruses.

6. Name the microorganisms which can fix atmospheric nitrogen in the soil.

Ans. Some microorganisms which can fix atmospheric nitrogen are as follows:

(a) Symbiotic bacterium–*Rhizobium*
(b) Free-living soil bacteria–*Azotobacter* and *Clostridium*
(c) Some cyanobacteria or blue-green algae–*Anabaena* and *Nostoc*

7. Write 10 lines on the usefulness of microorganisms in our lives.

Ans. Usefulness of microorganisms:

- Bacteria help in the formation of curd, pickles, etc.
- They help in preparation of wine and vinegar.
- They help in making cheese.
- Bacteria help in the ripening of tea leaves that gives them aroma and flavour.
- Yeast is used in baking industry for making bread, pastries, cakes, etc.
- They are used to prepare medicines like antibiotics, etc.
- Microbes are used to prepare vaccines.
- Bacteria are used in the leather industry.
- Microorganisms are used to increase soil fertility.
- Some bacteria are used in sewage treatment plants to decompose waste.

8. Write a short paragraph on the harmful effects of microorganisms.

Ans. Many microorganisms are harmful to us. They cause diseases, spoil our food and damage our goods made of clothes, paper, leather, etc. They cause diseases in humans, animals and plants. The diseases, which spread through microorganisms from person-to-person, are called communicable diseases. These diseases may spread through air we breathe, water we drink or food we eat. Communicable diseases are also known as infectious diseases. Any disease caused due to consumption of contaminated food or drink is called food poisoning. Certain microorganisms like bacteria, viruses or parasites grow on food and produce toxic substances that spoil the food.

9. What are antibiotics? What precautions must be taken while taking antibiotics?

Ans. Antibiotics are the substances that are obtained from some microorganisms and they kill or stop the growth of disease-causing microorganisms.

Antibiotics should be taken under the supervision of a qualified doctor. They should not be taken in overdose because they may cause harmful effects or may become less effective if needed in future. Also they kill the useful bacteria of the alimentary canal.

CHAPTER 3.
SYNTHETIC FIBRES AND PLASTICS

1. Explain why some fibres are called synthetic.

Ans. Some fibres are made by human beings through chemical process. That is why, they are called synthetic fibres.

2. Mark (✓) the correct answer.

Rayon is different from synthetic fibres because

(a) it has a silk-like appearance.
(b) it is obtained from wood pulp.
(c) its fibres can also be woven like those of natural fibres.

Ans. (b)

3. Fill in the blanks with appropriate words.

(a) Synthetic fibres are also called _____ or _____ fibres.

(b) Synthetic fibres are synthesised from raw material called _____.

(c) Like synthetic fibres, plastic is also a _____.

Ans. (a) artificial, man-made (b) petrochemicals (c) polymer

4. Give examples which indicate that nylon fibres are very strong.

Ans. The following examples show that nylon fibres are very strong.

(a) They are used to make ropes for rock climbing.

(b) They are used to make car seat belts.

(c) They are used to make fishing nets.

5. Explain why plastic containers are favoured for storing food.

Ans. Plastic containers are favoured for storing food because they are lightweight and easy to handle. Also they have lower price and good strength.

6. Explain the difference between thermoplastic and thermosetting plastics.

Ans.

Thermoplastics	Thermosetting plastics
1. Thermoplastics soften and get deformed on heating.	1. Thermosetting plastics do not soften or melt on heating.
3. Thermoplastics can be reshaped as many times as desired, e.g., PVC, polystyrene, polythene, etc.	3. Thermosetting plastics once set, cannot be reshaped even on heating, e.g., bakelite, melamine, etc.

7. Explain why the following are made of thermosetting plastics.

(a) Saucepan handles

(b) Electric plugs/switches/plug boards

Ans. (a) Saucepan handles are made of bakelite because it is a poor conductor of heat, i.e., it does not melt on heating or becomes hot.

(b) Electric plugs/switches/plug boards are made of bakelite because it is a poor conductor of electricity, i.e., it does not allow electric current to pass.

8. Categorise the materials of the following products into 'can be recycled' and 'cannot be recycled'.

Telephone instruments, plastic toys, cooker handles, carry bags, ball point pens, plastic bowls, plastic covering on electrical wires, plastic chairs, electrical switches.

Ans. The products that can be recycled are plastic toys, carry bags, ball point pens, plastic bowls, plastic covering and electrical wires. The products that cannot be recycled are telephone instruments, cooker handles and electrical switches.

9. Rana wants to buy shirts for summer. Should he buy cotton shirts or shirts made from synthetic material? Advise Rana, giving your reason.

Ans. He should buy cotton shirts for summer because they absorb the sweat released by his body and keep his body cool.

10. Give examples to show that plastics are noncorrosive in nature.

Ans. The examples plastic mug and plastic handles of cooking utensils do not react with air and water when tested with them. As a result, they do not get corroded and are considered noncorrosive in nature.

11. Should the handle and bristles of a tooth brush be made of the same material? Explain your answer.

Ans. The handle and bristles of a toothbrush should be made of the same material called thermoplastic because they can bend easily, are lightweight, strong and durable.

12. 'Avoid plastics as far as possible'. Comment on this advice.

Ans. Plastics are nonbiodegradable, i.e., do not get decomposed easily. When thrown carelessly, they may choke the drains and affect the sewage system causing water to overflow. As a result, mosquitoes breed in choked drains spreading diseases like malaria and dengue. Cows and other animals may swallow these plastics thrown in the garbage. This may even result in the death of animals. On burning these waste plastics, they release toxic gases and cause air pollution. Therefore, we should avoid plastic as far as possible.

13. Match the terms of column A correctly with the phrases given in column B.

A	B
(i) Polyester	**(a) Prepared by using wood pulp**
(ii) Teflon	**(b) Used for making parachutes and stockings**
(iii) Rayon	**(c) Used to make non-stick cookwares**
(iv) Nylon	**(d) Fabrics do not wrinkle easily**

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

14. 'Manufacturing synthetic fibres is actually helping conservation of forests'. Comment.

Ans. Synthetic fibres are made by human beings through chemical processes. To make synthetic fibres, there is no use of plant and animal materials. Plants and animals are necessary parts of forests. This shows that manufacturing synthetic fibres is usually helping conservation of forests.

15. Describe an activity to show that thermoplastic is a poor conductor of electricity.

Ans. Take a polythene bag and allow the electric current from a dry cell to pass through it. We observe that the electric current does not pass through it. This shows that thermoplastic, i.e., polythene bag, is a poor conductor of electricity.

CHAPTER 4.
MATERIALS: METALS AND NONMETALS

1. Which of the following can be beaten into thin sheets?
(a) Zinc (b) Phosphorus (c) Sulphur (d) Oxygen

Ans. (a)

2. Which of the following statements is correct?
(a) All metals are ductile.
(b) All non-metals are ductile.
(c) Generally, metals are ductile.
(d) Some non-metals are ductile.

Ans. (c)

3. Fill in the blanks.
(a) Phosphorus is a very _____ non-metal.
(b) Metals are _____ conductors of heat and _____.
(c) Iron is _____ reactive than copper.
(d) Metals react with acids to produce _____ gas.

Ans. (a) reactive (b) good; electricity (c) more (d) hydrogen

4. Mark 'T' if the statement is true and 'F' if it is false.
(a) Generally, non-metals react with acids.
(b) Sodium is a very reactive metal.
(c) Copper displaces zinc from zinc sulphate solution.
(d) Coal can be drawn into wires.

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

5. Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Properties	Metals	Non-metals
1. Appearance 2. Hardness 3. Malleability 4. Ductility 5. Heat Conduction 6. Conduction of Electricity		

Ans.

Properties	Metals	Non-metals
1. Appearance	Lustrous	Dull
2. Hardness	Hard	Soft
3. Malleability	Malleable	Brittle
4. Ductility	Ductile	Nonductile
5. Heat Conduction	Good conductors	Bad conductors
6. Conduction of Electricity	Good conductors	Bad conductors

6. Give reasons for the following.
(a) Aluminium foils are used to wrap food items.
(b) Immersion rods for heating liquids are made up of metallic substances.
(c) Copper cannot displace zinc from its salt solution.
(d) Sodium and potassium are stored in kerosene.

Ans. (a) Aluminium foils are use to wrap food items because they are leakproof, sturdy, stackable and keep food items fresh for longer time.

(b) Immersion rods for heating liquids are made up of metallic substances because metallic substances are good conductors of heat. As a result, they heat the liquids quickly.

(c) Copper is less reactive than zinc, therefore, it cannot displace zinc from its salt solution.

(d) Sodium and potassium are highly reactive. They violently react with air and water even at room temperature. That is why, they are kept under kerosene.

7. Can you store lemon pickle in an aluminium utensil? Explain.

Ans. No, lemon pickle contains a weak acid which reacts with metals like aluminium to form toxic and poisonous salt. This salt may cause food poisoning. Therefore, lemon pickle cannot be stored in an aluminium utensil.

8. Match the substances given in Column A with their uses given in Column B.

A	B
(i) Gold	**(a) Thermometers**
(ii) Iron	**(b) Electric wire**
(iii) Aluminium	**(c) Wrapping food**
(iv) Carbon	**(d) Jewellery**
(v) Copper	**(e) Machinery**
(vi) Mercury	**(f) Fuel**

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

9. What happens when

(a) Dilute sulphuric acid is poured on a copper plate?

(b) Iron nails are placed in copper sulphate solution?

Write word equations of the reactions involved.

Ans. (a) When dilute sulphuric acid is poured on a copper plate, copper sulphate and hydrogen gas are formed.

Copper + Dil. Sulphuric acid → Copper sulphate + Hydrogen gas

(b) When iron nails are placed in copper sulphate solution, they displace copper from its salt solution and form iron(II) sulphate and copper.

Iron nails + Copper sulphate solution → Iron(II) sulphate + Copper

10. Saloni took a piece of burning charcoal and collected the gas evolved in a test tube.

(a) How will she find the nature of the gas?

(b) Write down word equations of all the reactions taking place in this process.

Ans. (a) She will find the poisonous gas named carbon monoxide along with carbon dioxide.

(b) $2C + O_2 \longrightarrow 2CO$

Carbon + Oxygen → Carbon monoxide (neutral)

$C + O_2 \longrightarrow CO_2$

Carbon + Oxygen → Carbon dioxide (acidic)

11. One day Reeta went to a jeweller's shop with her mother. Her mother gave an old gold jewellery to the goldsmith to polish. Next day when they brought the jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?

Ans. When goldsmith dissolves old gold jewellery in a mixture of nitric acid and conc. hydrochloric acid in the ratio 1 : 3, a little quantity of gold gets dissolved in this mixture. That is why, they found a slight loss in the weight of jewellery.

CHAPTER 5.
COAL AND PETROLEUM

1. What are the advantages of using CNG and LPG as fuels?

Ans. The advantages of using CNG and LPG as fuels are that they are less polluting and cleaner fuels. They do not produce smoke but give more heat as compared to other fuels.

2. Name the petroleum product used for surfacing of roads.

Ans. Bitumen is used for surfacing the roads.

3. Describe how coal is formed from dead vegetation. What is this process called?

Ans. About three hundred million years ago, the earth was covered with dense forests and swamps. The trees and plants of dense forests died and fell down on the wet and swampy floor of the forest, and began to sink into the soil. More and more dead plants, gravel and soil deposited over them. The heat and pressure from the top layers gradually turned the remains of plants into coal.

The slow conversion of dead trees and plants into coal is called carbonisation.

4. Fill in the blanks.

(a) Fossil fuels are _____, _____ and _____.

(b) Process of separation of different constituents from petroleum is called _____.

(c) Least polluting fuel for vehicle is _____.

Ans. (a) Coal; petroleum; natural gas (b) refining (c) CNG

5. Tick True/False against the following statements.

(a) Fossil fuels can be made in the laboratory.

(b) CNG is more polluting fuel than petrol.

(c) Coke is almost pure form of carbon.

(d) Coal tar is a mixture of various substances.

(e) Kerosene is not a fossil fuel.

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

6. Explain why fossil fuels are exhaustible natural resources.

Ans. Fossil fuels such as coal, petroleum and natural gas are exhaustible natural resources because they are found in limited amount in nature, cannot be continually replenished and are likely to be exhausted by various human activities.

7. Describe characteristics and uses of coke.

Ans. The characteristics of coke are:

(a) It is a tough, porous and black substance.

(b) It is an almost pure form of carbon.

Uses of coke are:

(a) It is used in the manufacture of steel.

(b) It is used in the extraction of many metals.

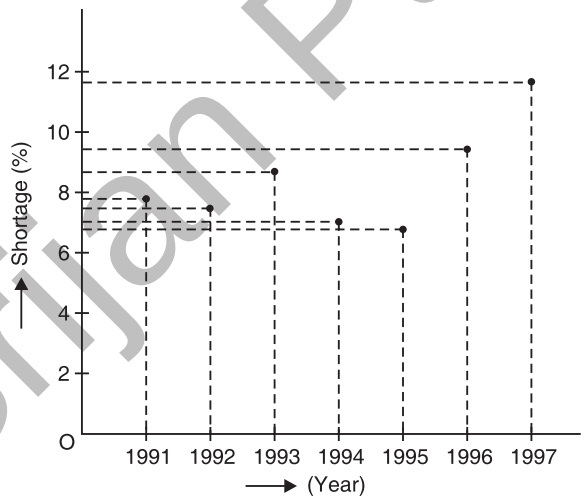
8. Explain the process of formation of petroleum.

Ans. Petroleum was formed from the remains of very tiny animals and plants that lived in the sea and died millions of years ago. After they died, their bodies sank and got buried at the bottom of the sea. Over the time, they were covered by layers of sand, silt and clay. Over millions of years, the layers of sand, silt and clay became very thick and the remains buried deeper and deeper. In the absence of air, enormous heat and pressure from these layers slowly changed the dead organisms into petroleum and natural gas.

9. The following Table shows the total power shortage in India from 1991–1997. Show the data in the form of a graph. Plot shortage percentage for the years on the Y-axis and the year on the X-axis.

S. No.	Year	Shortage (%)
1.	1991	7.9
2.	1992	7.8
3.	1993	8.3
4.	1994	7.4
5.	1995	7.1
6.	1996	9.2
7.	1997	11.5

Ans.



Chapter 6.
Combustion and Flame

1. List conditions under which combustion can take place.

Ans. The conditions necessary for combustion to occur are:
(a) Presence of air or oxygen – supporter of combustion.
(b) Presence of a combustible substance – fuel.
(c) Attainment of ignition temperature.

2. Fill in the blanks.
(a) Burning of wood and coal causes _____ of air.
(b) A liquid fuel, used in homes is _____.
(c) Fuel must be heated to its _____ before it starts burning.
(d) Fire produced by oil cannot be controlled by _____.

Ans. (a) pollution (b) LPG (c) ignition temperature (d) water

3. Explain how the use of CNG in automobiles has reduced pollution in our cities.

Ans. On burning, CNG produces the harmful products in very small amounts. It is a cleaner fuel as compared to petrol and diesel. That is why, we can say that the use of CNG in automobiles has reduced pollution in our cities.

4. Compare LPG and wood as fuels.

Ans. LPG is a cleaner fuel. It burns completely and does not produce any harmful gas whereas wood does not burn completely. As a result of incomplete combustion, wood gives poisonous carbon monoxide gas.

5. Give reasons.
(a) Water is not used to control fires involving electrical equipment.
(b) LPG is a better domestic fuel than wood.
(c) Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.

Ans. (a) Water is a good conductor of electricity. If it is used to put out fire caused by electricity, it will pass electric current giving electric shock to the person trying to put out fire. So water is not used to put out fires involving electrical equipments.
(b) LPG is a better domestic fuel than wood because it burns completely and does not give any poisonous gas.
(c) Ignition temperature of paper by itself is lower than a piece of paper wrapped around an aluminium pipe as aluminium is a good conductor of heat. As a result, heat gained by paper is conducted quickly by the aluminium pipe and the ignition temperature of a piece of paper around an aluminium pipe is not reached. Therefore, it does not burn.

6. Make a labelled diagram of a candle flame.

Ans.

Candle flame

7. Name the unit in which the calorific value of a fuel is expressed.

Ans. The calorific value of a fuel is expressed in kilojoule per kg (kJ/kg).

8. Explain how CO_2 is able to control fires.

Ans. Carbon dioxide is a nonsupporter of burning. It displaces or takes away oxygen from the surrounding area by preventing the supply of oxygen to the combustible substance. This extinguishes the fire.

9. It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain.

Ans. The ignition temperature of dry leaves is lower than a heap of green leaves because green leaves contain a lot of water in them. As a result, ignition temperature of a heap of green leaves is not reached and it is difficult to burn.

10. Which zone of a flame does a goldsmith use for melting gold and silver and why?

Ans. A goldsmith uses the outermost zone of a flame for melting gold and silver because in this zone, a nonluminous blue flame with very high temperature is obtained due to presence of oxygen in plenty.

11. In an experiment 4.5 kg of a fuel was completely burnt. The heat produced was measured to be 180,000 kJ. Calculate the calorific value of the fuel.

Ans. Calorific value of the fuel = $\frac{180,000}{4.5}$ = 40,000 kJ/kg

12. Can the process of rusting be called combustion? Discuss.

Ans. The process of rusting cannot be called combustion because though it occurs in the presence of oxygen gas but it does not produce heat and light.

13. Abida and Ramesh were doing an experiment in which water was to be heated in a beaker. Abida kept the beaker near the wick in the yellow part of the candle flame. Ramesh kept the beaker in the outermost part of the flame. Whose water will get heated in a shorter time?

Ans. The beaker kept by Ramesh in outermost part of the flame will get heated in a shorter time due to its highest temperature 1400°C.

CHAPTER 7.
CONSERVATION OF PLANTS AND ANIMALS

1. Fill in the blanks.
(a) A place where animals are protected in their natural habitat is called _____.
(b) Species found only in a particular area is known as _____.
(c) Migratory birds fly to far away places because of _____ changes.

Ans. (a) protected (b) endemic species (c) climatic

2. Differentiate between the following.
(a) Wildlife sanctuary and biosphere reserve
(b) Zoo and wildlife sanctuary
(c) Endangered and extinct species
(d) Flora and fauna

Ans. (a)

Wildlife Sanctuary	Biosphere Reserve
1. It is a smaller area.	1. It is very large area.
2. Private ownership rights to collect minor forest products are provided.	2. Multiple land use is allowed.
3. It protects and conserves the plants and animals.	3. It is meant to conserve and maintain biodiversity as well as culture of the area.

(b) **Zoo:** In a zoo, wild animals are kept in cages, in captivity.
Wildlife sanctuary: A wildlife sanctuary is a protected land area reserved for the protection of wild animals, birds and plants. Hunting is strictly prohibited there. However, private ownership rights for collecting minor forest products, harvesting of timber and cultivation are granted so long as they do not interfere with the life of wild animals.

(c) **Endangered species:** The species that are not likely to survive and will soon become extinct, if the causative factors continue, are called endangered species.
Extinct species: Species of plants and animals which are lost forever are called extinct species.

(d) The plants found typically in a particular area form the **flora** of that area. The term **fauna** represents the wild animals found in a particular place or geographical region.

3. Discuss the effects of deforestation on the following.
(a) Wild animals
(b) Environment
(c) Villages (Rural areas)
(d) Cities (Urban areas)
(e) Earth
(f) The next generation

Ans. (a) Deforestation leads to loss of natural habitats of wild animals and depletion of their food sources. This condition leads to loss of wildlife.

(b) Deforestation increases temperature, reduces rainfall and increases wind velocity. These changes lead to climatic changes.

(c) Deforestation leads to flood, desertification of fertile land and causes soil erosion. This affects the agriculture and grazing areas of cattle. Also, fodder, firewood, fibres, etc. become short to rural people.

(d) In the absence of forests, the climate of urban areas changes drastically. The air becomes polluted. Many useful products obtained from forests are not available. For example, medicines, fibres, fruits, and wood or timber for making houses, furniture, buildings, etc. will be scarce.

(e) Deforestation increases the level of carbon dioxide in the atmosphere. This causes the greenhouse effect which leads to global warming.

(f) The next generation will be devoid of all the benefits of forests and will suffer a healthy and harmonious life.

4. What will happen if

(a) we go on cutting trees.

(b) the habitat of an animal is disturbed.

(c) the top layer of soil is exposed.

Ans. (a) It will lead to desertification, soil erosion and serious environmental problems such as global warming, rise in the sea level, etc. This will ultimately affect all the living beings.

(b) This will disturb the life, growth and reproductive potential of that animal.

(c) It will be blown away by the wind or washed away by the running water making the soil infertile.

5. Answer in brief.

(a) Why should we conserve biodiversity?

(b) Protected forests are also not completely safe for wild animals. Why?

(c) Some tribals depend on the jungle. How?

(d) What are the causes and consequences of deforestation?

(e) What is Red Data Book?

(f) What do you understand by the term migration?

Ans. (a) Wildlife is a valuable biological resource. The conservation of biodiversity is essential because:

- Biodiversity maintains a balance in nature or in the ecosystem through food chains and food webs.
- Biodiversity regulates climate, rainfall and wind speed.
- Wild animals and plants provide a variety of commodities.
- Wildlife is needed for breeding programmes in agriculture, horticulture, sericulture, apiculture, etc.
- It helps in cycling of nutrients and preservation of soil fertility.

We, the human beings, are a part of nature and all the components of nature are interdependent. Any damage to biodiversity will threaten the human existence. Therefore, biodiversity needs to be conserved.

(b) Encroachment by people living in the neighbourhood, indiscriminate killing and poaching of wild animals for skin, fur, horn and tusk has caused reduction and elimination of many wild animals living in protected forests.

(c) Forests support tribal people living there by providing them with a variety of essential commodities such as food, fodder, firewood, fruits, fibres, medicines, essential oils, etc.

(d) **Causes of deforestation:** Human activities such as felling trees for timber wood, cleaning land for cultivation of crops, vegetables and fruits, building houses, factories, roads and for mining, etc. There are some natural causes such as forest fires, severe droughts, floods, earthquakes, landslides, pests, and viral and fungal diseases of plants that lead to deforestation.

Consequences of deforestation: Deforestation leads to:

- Global warming due to increased level of carbon dioxide in nature.
- Climate change due to decrease in rainfall and increase in temperature and wind speed.
- Desertification due to reduction in water-holding capacity of the soil.
- Droughts due to disturbed water cycle, reduced rains and lowered water table.
- Soil erosion and floods due to decreased water-holding capacity of soil.
- Loss of wildlife due to loss of natural habitats of wild animals and plants.
- Depletion of resources displaces tribal people who depend on forests for their livelihood.

(e) The Red Data Book is a record of all those species of plants and animals which are under the threat of extinction or are rare and vulnerable for extinction. It is maintained by WCU, Switzerland. This book provides information about the distribution and status of threatened species, and guides their conservation programmes.

(f) Migration is the seasonal movement of an animal from its habitat to some safer area, due to climatic changes, where it breeds and returns when climatic conditions become favourable.

6. In order to meet the ever-increasing demand in factories and for shelter, trees are being continually cut. Is it justified to cut trees for such projects? Discuss and prepare a brief report.

Ans. Because of great increase in human population, more and more trees are cut every day. This has led to the rapid decline in biodiversity. This is also causing changes in the temperature and rainfall patterns. These are responsible for global warming and melting of glaciers. Such changes have adverse effects on biodiversity.

Thus, alternative sources for forest products should be explored. To restore forest cover and forest wealth, tree saplings should be planted regularly. This will ensure regular supply of forest products and will not disturb the ecological balance in nature.

7. How can you contribute to the maintenance of green wealth of your locality? Make a list of actions to be taken by you.

Ans. (a) Creating awareness in mass regarding the importance of plants through different media.
(b) Establishing the Ecoclubs in housing societies.
(c) Organising debates, strect shows, poster making competitions, etc.
(d) Plantings the saplings of trees on bare land.

8. Explain how deforestation leads to reduced rainfall.

Ans. Deforestation leads to increased amount of carbon dioxide in air which results in global warming, i.e., increase in the earth's temperature. This disturbs water cycle which reduces rainfall.

9. Find out about national parks in your state. Identify and show their location on the outline map of India.

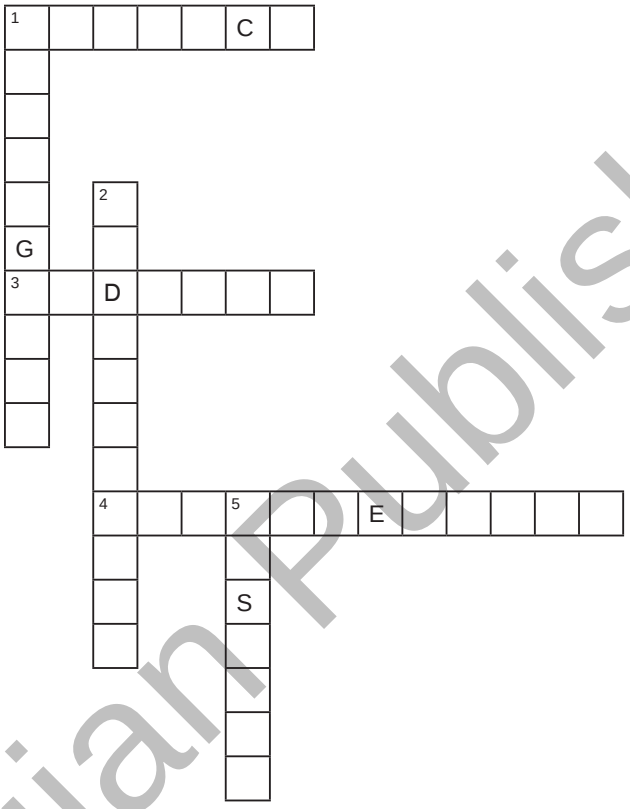
Ans. Do yourself.

10. Why should paper be saved? Prepare a list of ways by which you can save paper.

Ans. Paper is made from wood. It takes 17 fully grown trees to make one tonne of paper. By saving paper, we can save many trees. Also, we save energy and water required for manufacturing paper.

Ways to save paper:
(a) Not wasting paper and minimising the use of paper.
(b) Taking maximum use of paper by writing on both sides of it.
(c) Using e-card instead of paper greeting cards or using old greeting cards and wedding cards for making new cards or invitation cards, etc.
(d) Reusing gift wrappers.
(e) Sending e-invitation wherever possible instead of paper invitations.

11. Complete the word puzzle.



Down
1. Species on the verge of extinction.
2. A book carrying information about endangered species.
5. Consequence of deforestation.

Across
1. Species which have vanished.
3. Species found only in a particular habitat.
4. Variety of plants, animals and microorganisms found in an area.

Ans. Down: 1. ENDANGERED **2.** RED DATA BOOK **5.** DESERTS
Across: 1. EXTINCT **3.** ENDEMIC **4.** BIODIVERSITY

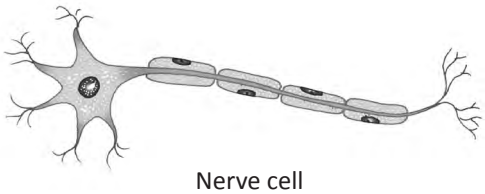
Chapter 8.
Cell–Structure and Functions

1. Indicate whether the following statements are True (T) or False (F).
(a) Unicellular organisms have one-celled body.
(b) Muscle cells are branched.
(c) The basic living unit of an organism is an organ.
(d) *Amoeba* has irregular shape.

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

2. Make a sketch of the human nerve cell. What function do nerve cells perform?

Ans.



Nerve cell

The nerve cell receives and transfers messages. Thus, it helps to control and coordinate the working of different parts of the body.

3. Write short notes on the following.
(a) Cytoplasm
(b) Nucleus of a cell

Ans. (a) Cytoplasm is a jelly-like semifluid substance that lies between the cell membrane and nucleus. It has up to 90% water. All chemical reactions inside the cell take place in the cytoplasm. A number of cell organelles are found suspended in the cytoplasm.

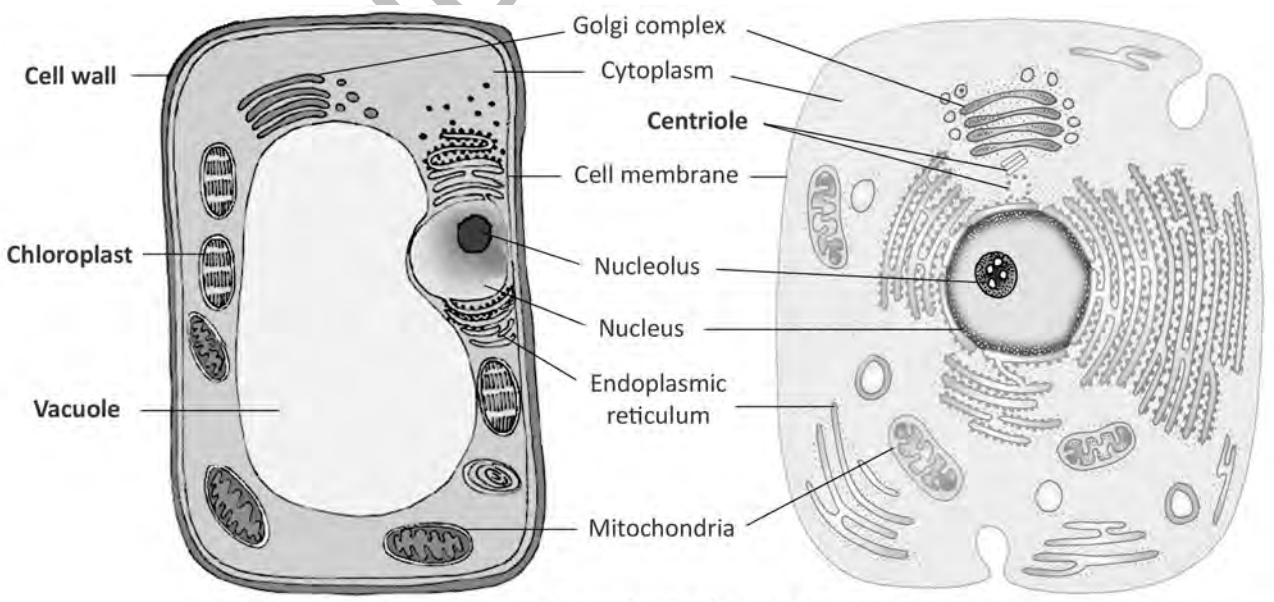
(b) Nucleus is a small spherical or oval structure. It is called the control centre of the cell. In animal cells, nucleus is located in the centre of the cell but in plant cells, it is shifted to one side because of the large central vacuole. The nucleus consists of four parts: nuclear envelop, nucleoplasm, nucleolus and chromosomes. The nuclear envelope surrounds the nucleus. Nucleoplasm is a dense fluid-like granular substance inside the nucleus. It contains a spherical body called nucleolus. Nucleolus contains ribonucleic acid (RNA) for the formation of ribosomes. In the nucleoplasm, there are fine thread-like structures called chromatin threads. They form chromatin net which condenses to form chromosomes.

4. Which part of the cell contains organelles?

Ans. Cytoplasm.

5. Make sketches of animal and plant cells. State three differences between them.

Ans.



Plant and animal cells showing differences

Differences between plant and animal cells

Cell structures	Plant cell	Animal cell
Cell wall	Present	Absent
Nucleus	Present on one side (in mature cell)	Present centrally
Plastids	Present	Absent
Centrioles	Absent	Present
Lysosomes	Absent	Present
Golgi bodies	Many, scattered	Only one
Vacuole	Present, one or two large vacuoles	Absent or few and small

6. State the difference between eukaryotes and prokaryotes.

Ans. Cells that have true nucleus are called eukaryotic cells while the cells without a true nucleus are called prokaryotic cells.

7. Where are chromosomes found in a cell? State their function.

Ans. Chromosomes are found in the nucleus. They are hereditary structures. They pass parental characters to the offspring.

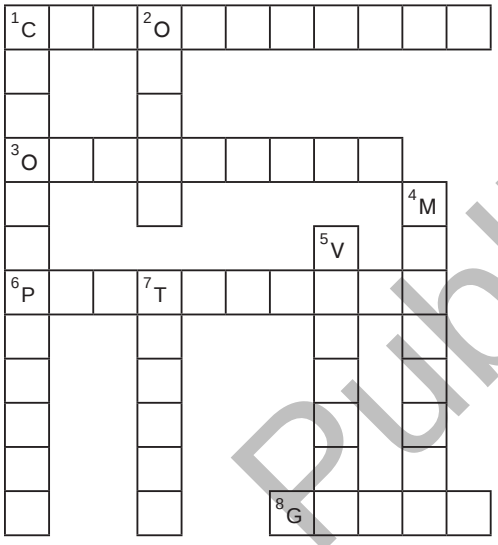
8. 'Cells are the basic structural units of living organisms'. Explain.

Ans. A cell is the smallest part of the body of an organism. It is able to carry out all the basic functions of life like metabolism, growth and reproduction. Every part of our body and every part of a plant is made up of hundreds of thousands of cells. Therefore, a cell is the basic unit of structure and function in all living beings.

9. Explain why chloroplasts are found only in plant cells?

Ans. Chloroplasts contain a green pigment called chlorophyll. This provides green colour to the leaves which is necessary for photosynthesis.

10. Complete the crossword with the help of clues given below.



Across

1. This is necessary for photosynthesis.
3. Term for component present in the cytoplasm.
6. The living substance in the cell.
8. Units of inheritance present on the chromosomes.

Down

1. Green plastids.
2. Formed by collection of tissues.
4. It separates the contents of the cell from the surrounding medium.
5. Empty structure in the cytoplasm.
7. A group of cells.

Ans. Across: 1. CHLOROPHYLL **3.** ORGANELLE **6.** PROTOPLASM **8.** GENES
Down: 1. CHLOROPLASTS **2.** ORGAN **4.** MEMBRANE **5.** VACUOLE **7.** TISSUE

Chapter 9.
Reproduction in Animals

1. Explain the importance of reproduction in organisms.

Ans. Reproduction is important in the life of organisms because it helps in the continuity of life from one generation to the next generation.

2. Describe the process of fertilisation in human beings.

Ans. The union of sperm and ovum is called fertilisation. In human beings, fertilisation occurs in the anterior part of oviduct.

3. Choose the most appropriate answer.

(a) Internal fertilisation occurs

(i) in female body. **(ii) outside female body.**

(iii) in male body. **(iv) outside male body.**

(b) A tadpole develops into an adult frog by the process of

(i) fertilisation **(ii) metamorphosis** **(iii) embedding** **(iv) budding**

(c) The number of nuclei present in a zygote is

(i) none **(ii) one** **(iii) two** **(iv) four**

Ans. (a) (i) (b) (ii) (c) (ii)

4. Indicate whether the following statements are True (T) or False (F).

(a) Oviparous animals give birth to young ones.
(b) Each sperm is a single cell.
(c) External fertilisation takes place in frog.
(d) A new human individual develops from a cell called gamete.
(e) Egg laid after fertilisation is made up of a single cell.
(f) Amoeba reproduces by budding.
(g) Fertilisation is necessary even in asexual reproduction.
(h) Binary fission is a method of asexual reproduction.
(i) A zygote is formed as a result of fertilisation.
(j) An embryo is made up of a single cell.

Ans. (a) (F) (b) (T) (c) (T) (d) (F) (e) (F) (f) (F) (g) (F) (h) (T) (i) (T) (j) (F)

5. Give two differences between a zygote and a foetus.

Ans. Zygote is a single-celled structure while foetus is a multicellular structure. Zygote does not resemble with adult form whereas a foetus resembles the human form.

6. Define asexual reproduction. Describe two methods of asexual reproduction in animals.

Ans. In asexual reproduction, a single organism (parent) produces genetically identical individuals of its own kind. The second parent is not needed.

The offspring produced by asexual reproduction are identical to each other and to the parent. They are called clones. Asexual reproduction is carried out in many ways:

- **Binary Fission:** It occurs in unicellular organisms like bacteria, *Ameoba* and *Paramecium.* First the nucleus of parent cell divides into two daughter nuclei. This is followed by the division of parent cell. Each half receives one daughter nucleus and forms a daughter organism. Thus, two daughter organisms are formed from one organism.
- **Budding:** In budding, a new organism is formed as an outgrowth from the parent body. In *Hydra,* a small bulge appears from the lower part of the body. This grows into a bud, detaches from parent body and develops into a young *Hydra.*

7. In which female reproductive organ does the embryo get embedded?

Ans. Uterus

8. What is metamorphosis? Give examples.

Ans. The change in form and shape from larva to adult is called metamorphosis.

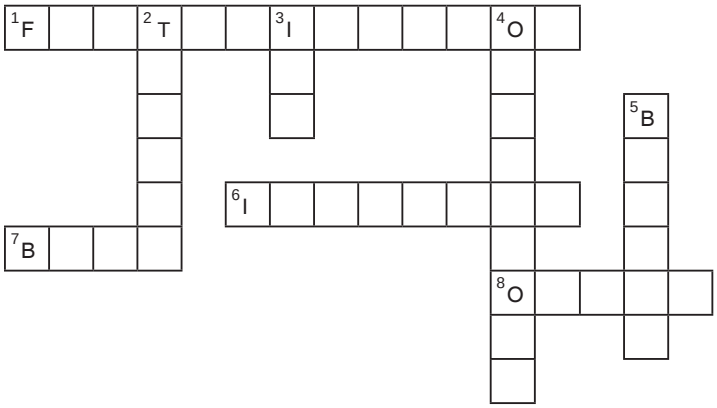
In frogs, the development of the embryo takes place outside the female body. The embryo develops inside the egg. The embryo hatches out of the egg as larva, called tadpole. The tadpole undergoes several changes in its form and structure and changes into an adult frog.

9. Differentiate between internal fertilisation and external fertilisation.

Ans. Internal Fertilisation: In internal fertilisation, fusion of male and female gametes takes place inside the body of the female. Internal fertilisation occurs in reptiles, insects, birds and mammals including human beings.

External Fertilisation: When the fusion of male and female gametes takes place outside the body of female, it is called external fertilisation. This type of fertilisation takes place in water. It is found in frog and aquatic animals such as fishes and starfishes.

10. Complete the crossword puzzle using the hints given below.



Across

1. **The process of the fusion of the gametes.**
6. **The type of fertilisation in hen.**
7. **The term used for bulges observed on the sides of the body of hydra.**
8. **Eggs are produced here.**

Down

2. **Sperms are produced in these male reproductive organs.**
3. **Another term for in vitro fertilisation.**
4. **These animals lay eggs.**
5. **A type of fission in amoeba.**

Ans. Across: 1. FERTILIZATION **6.** INTERNAL **7.** BUDS **8.** OVARY
Down: 2. TESTES **3.** IVF **4.** OVIPAROUS **5.** BINARY

Chapter 10.
Reaching the Age of Adolescence

1. What is the term used for chemical secretions of endocrine glands responsible for changes taking place in the body?

Ans. Hormone.

2. Define adolescence.

Ans. The period of life when the body undergoes changes leading to reproductive maturity is called adolescence.

3. What is menstruation? Explain.

Ans. Menstruation is the periodic discharge of blood and lining of uterus in females. Between two successive ovulations, the wall of uterus becomes thick and vascular to receive the developing embryo. In case the egg is fertilised, pregnancy is results. In case ovum is not fertilised, the thickened lining of uterine wall and its blood capillaries break down. This causes bleeding. This blood discharge is called menstrual flow and it lasts for 3 to 7 days. The cycle of breakdown of wall of uterus and its blood capillaries causing menstrual flow every 28th day is called menstruation or menstrual cycle.

4. List changes in the body that take place at puberty.

Ans. The changes that take place at puberty are:

(a) Increase in height
(b) Changes in body shape
(c) Change in voice box and voice
(d) Increase in the activity of sweat glands and sebaceous glands
(e) Maturation of sex organs
(f) Growth of beard and moustaches in boys
(g) Beginning of menstruation in girls

5. Prepare a Table having two columns depicting names of endocrine glands and hormones secreted by them.

Ans.

Endocrine Gland	Hormones Secreted
1. Pituitary Gland (Master gland)	• Growth hormone (GH) • Follicular Stimulating Hormone (FSH) • Several other hormones
2. Adrenal (2 in number)	• Adrenaline (emergency hormone) • Other hormones
3. Thyroid	• Thyroxine
4. Pancreas	• Insulin
5. Testes (In males)	• Testosterone
6. Ovaries (In females)	• Estrogen • Progesterone

6. What are sex hormones? Why are they named so? State their function.

Ans. Hormones secreted by testes and ovaries are called sex hormones. Testes secrete testosterone and ovaries secrete estrogen. They are secreted by sex organs so they are called sex hormones. They stimulate changes in the body and produce secondary sexual characters in males and females.

7. Choose the correct option.

(a) Adolescents should be careful about what they eat, because
- **(i) proper diet develops their brains.**
- **(ii) proper diet is needed for the rapid growth taking place in their body.**
- **(iii) adolescents feel hungry all the time.**
- **(iv) taste buds are well developed in teenagers.**

(b) Reproductive age in women starts when their
- **(i) menstruation starts.**
- **(ii) breasts start developing.**
- **(iii) body weight increases.**
- **(iv) height increases.**

(c) The right meal for adolescents consists of
- **(i) chips, noodles, coke.**
- **(ii) *chapati*, *dal*, vegetables.**
- **(iii) rice, noodles and burger.**
- **(iv) vegetable cutlets, chips and lemon drink.**

Ans. (a) (ii) (b) (i) (c) (ii)

8. Write notes on

(a) Adam's apple

(b) Secondary sexual characters

(c) Sex determination in the unborn baby

Ans. (a) At puberty in boys, the larynx begins to grow and protrudes out in the throat region. This is called Adam's apple.

(b) The external features that help to distinguish a male from a female are called secondary sexual characters. For example, beard and moustaches, hair on chest and thighs, adam's apple in males, and developed breasts, wide pelvic region and shrill voice in females.

(c) The sex chromosomes are the X and Y-chromosomes that determine the gender (sex) of a human baby. Males have X and Y chromosomes, whereas females have two X chromosomes.

The sperm carries either an X chromosome or a Y chromosome. The egg or the ovum of a female contains only X chromosomes.

If sperm carrying X chromosome fertilises the egg, then the resulting zygote will be XX, i.e., a female child.

If the sperm carrying Y chromosome fertilises the egg, then the resulting zygote will be XY, i.e., a male child.

9. Word game : Use the clues to work out the words.

Across

3. Protruding voice box in boys

4. Glands without ducts

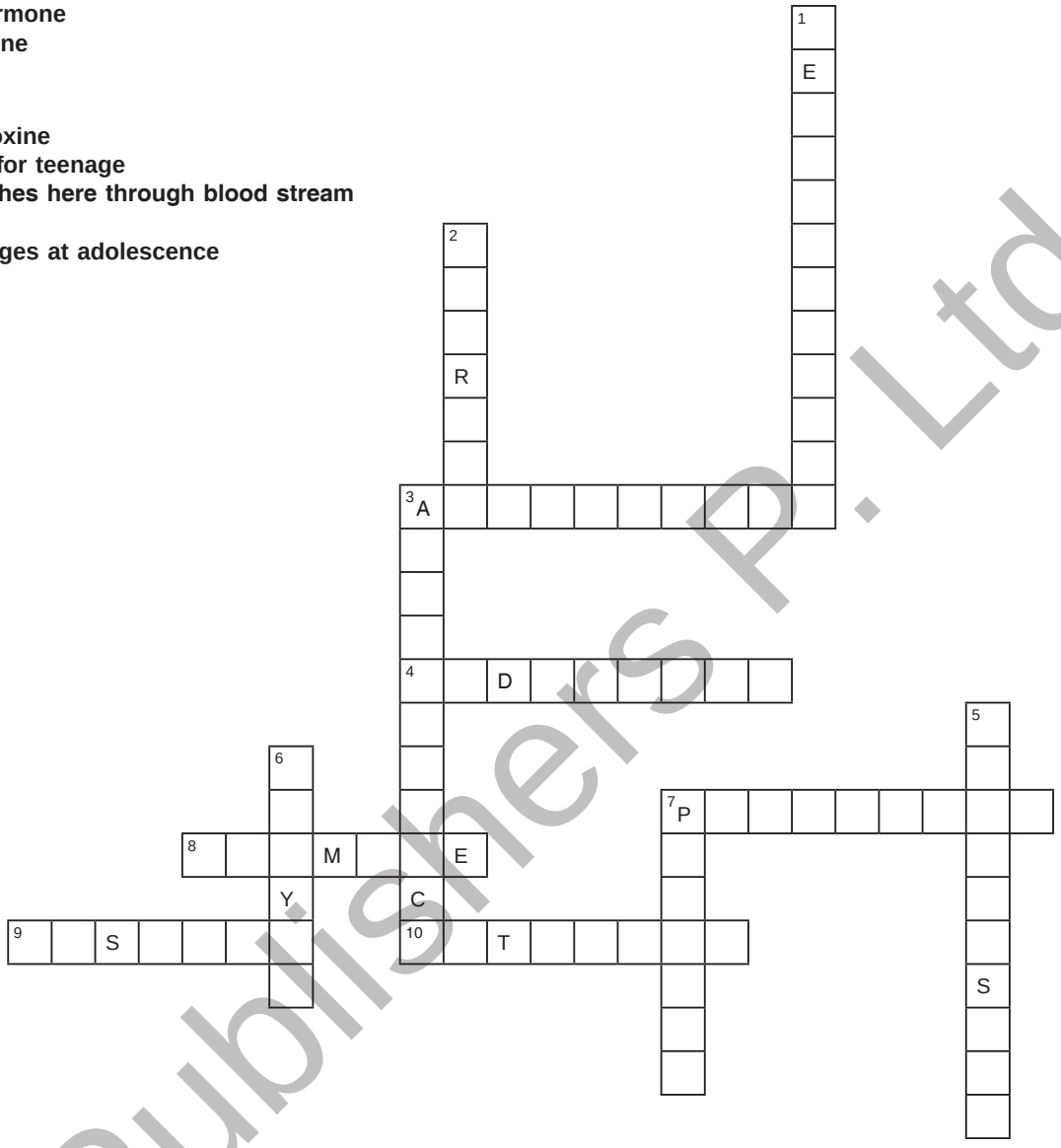
7. Endocrine gland attached to brain

8. Secretion of endocrine glands

9. Pancreatic hormone
10. Female hormone

Down

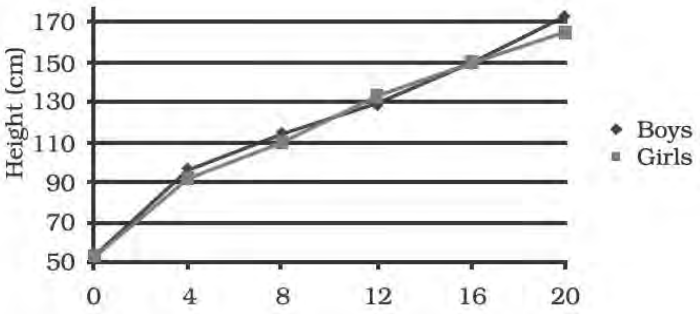
1. Male hormone
2. Secretes thyroxine
3. Another term for teenage
5. Hormone reaches here through blood stream
6. Voice box
7. Term for changes at adolescence



Ans. Across: 3. ADAM'S APPLE **4.** ENDOCRINE **7.** PITUITARY **8.** HORMONE **9.** INSULIN **10.** ESTROGEN
Down: 1. TESTOSTERONE **2.** THYROID **3.** ADOLESCENCE **5.** TARGET SITE **6.** LARYNX **7.** PUBERTY

10. The table below shows the data on likely heights of boys and girls as they grow in age. Draw graphs showing height and age for both boys and girls on the same graph paper. What conclusions can be drawn from these graphs?

Age (Years)	Height (cm)	
	Boys	Girls
0	53	53
4	96	92
8	114	110
12	129	133
16	150	150
20	173	165



Ans. During childhood, the height of boys increases more than the girls. But, on reaching adolescent stage, the height of girls increases very fast and then slows down after reaching 16 years of age.

Chapter 11.
Force and Pressure

1. Give two examples each of situations in which you push or pull to change the state of motion of objects.

Ans. Two examples showing push or pull in order to change the state of motion of objects are pushing a trolley and pulling a drawer.

2. Give two examples of situations in which applied force causes a change in the shape of an object.

Ans. Two examples showing a change in the shape of an object on applying force are pressing a lump of dough with hands and stretching a rubber band.

3. Fill in the blanks in the following statements.

(a) To draw water from a well we have to _____ at the rope.

(b) A charged body _____ an uncharged body towards it.

(c) To move a loaded trolley we have to _____ it.

(d) The north pole of a magnet _____ the north pole of another magnet.

Ans. (a) pull (b) attracts (c) push (d) repels

4. An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information, fill up the gaps in the following statements using the following terms.

muscular, contact, non-contact, gravity, friction, shape, attraction

(a) To stretch the bow, the archer applies a force that causes a change in its _____.

(b) The force applied by the archer to stretch the bow is an example of _____ force.

(c) The type of force responsible for a change in the state of motion of the arrow is an example of a _____ force.

(d) While the arrow moves towards its target, the forces acting on it are due to _____ and that due to _____ of air.

Ans. (a) shape (b) muscular (c) contact (d) gravity, friction

5. In the following situations identify the agent exerting the force and the object on which it acts. State the effect of the force in each case.

(a) Squeezing a piece of lemon between the fingers to extract its juice.

(b) Taking out paste from a toothpaste tube.

(c) A load suspended from a spring while its other end is on a hook fixed to a wall.

(d) An athlete making a high jump to clear the bar at a certain height.

Ans. (a) Here, fingers are agent and a piece of lemon is object on which force acts. When force acts on the lemon, its shape changes and juice is pushed out of it.

(b) Here, thumb is agent and a toothpaste tube is an object on which force acts. When pushing a toothpaste tube, paste comes out of it and the shape of the tube gets changed.

(c) Here, spring is an object and a load is an agent. When a load is suspended from a spring, spring gets stretched.

(d) Here, an athlete is an agent and the earth is an object on which force acts. When an athlete makes a high jump, he pushes the ground in order to change the position.

6. A blacksmith hammers a hot piece of iron while making a tool. How does the force due to hammering affect the piece of iron?

Ans. The force due to hammering changes the shape of the piece of iron.

7. An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

Ans. Electrostatic force is responsible for the attraction between the balloon and the wall.

8. Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.

Ans. Muscular force and gravitational force. Because muscular force acts upwards and gravitational force acts downwards in order to maintain the balance and there is no possibility of change in the state of motion.

9. A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket immediately after leaving the launching pad.

Ans. Gravitational force and mechanical force act on the rocket immediately after leaving the launching pad.

10. When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to

(a) pressure of water.
(b) gravity of the earth.
(c) shape of rubber bulb.
(d) atmospheric pressure.

Ans. (d)

CHAPTER 12.
FRICTION

1. Fill in the blanks.
(a) Friction opposes the _____ between the surfaces in contact with each other.
(b) Friction depends on the _____ of surfaces.
(c) Friction produces _____.
(d) Sprinkling of powder on the carrom board _____ friction.
(e) Sliding friction is _____ than the static friction.

Ans. (a) relative motion (b) nature (c) heat (d) reduces (e) smaller

2. Four children were asked to arrange forces due to rolling, static and sliding frictions in a decreasing order. Their arrangements are given below. Choose the correct arrangement.
(a) rolling, static, sliding
(b) rolling, sliding, static
(c) static, sliding, rolling
(d) sliding, static, rolling

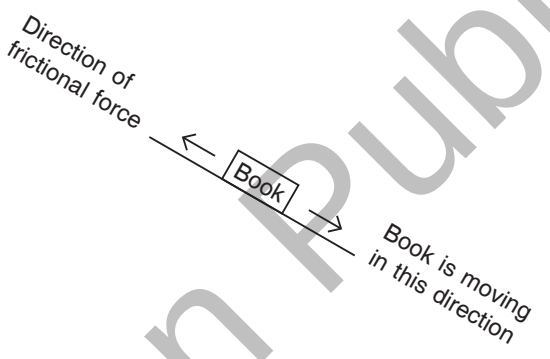
Ans. (c)

3. Alida runs her toy car on dry marble floor, wet marble floor, newspaper and towel spread on the floor. The force of friction acting on the car on different surfaces in increasing order will be
(a) wet marble floor, dry marble floor, newspaper and towel.
(b) newspaper, towel, dry marble floor, wet marble floor.
(c) towel, newspaper, dry marble floor, wet marble floor.
(d) wet marble floor, dry marble floor, towel, newspaper

Ans. (a)

4. Suppose your writing desk is tilted a little. A book kept on it starts sliding down. Show the direction of frictional force acting on it.

Ans.



5. You spill a bucket of soapy water on a marble floor accidently. Would it make it easier or more difficult for you to walk on the floor? Why?

Ans. It would make it more difficult to walk on the floor because smoothness of floor and slippery nature of soap will reduce the friction.

6. Explain why sportsmen use shoes with spikes.

Ans. Sportsmen use shoes with spikes in order to have an extra grip on the ground while playing.

7. Iqbal has to push a lighter box and Seema has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?

Ans. Seema will apply a larger force because heavier the box, larger is the force of friction acting on it.

8. Explain why sliding friction is less than static friction.

Ans. Lesser force is required to move the object while sliding whereas larger force is required to move the object in static condition because it is in rest position. Therefore, sliding friction is less than static friction.

9. Give examples to show that friction is both a friend and a foe.

Ans. Fixing a nail on the wall is not possible without friction. This example shows that friction is necessary or a friend. Rubbing of mechanical parts produces heat and damages the moving parts. This example shows that friction is a foe or an evil.

10. Explain why objects moving in fluids must have special shapes.

Ans. The objects moving in fluids must have special shapes because these objects require a lot of energy to overcome the drag. To reduce this problem, these objects are having a special body shape called streamlined shape.

CHAPTER 13.
SOUND

1. Choose the correct answer.

Sound can travel through

(a) gases only
(b) solids only
(c) liquids only
(d) solids, liquids and gases.

Ans. (d)

2. Voice of which of the following is likely to have minimum frequency?

(a) Baby girl
(b) Baby boy
(c) A man
(d) A woman

Ans. (c)

3. In the following statements, tick 'T' against those which are true, and 'F' against those which are false.

(a) Sound cannot travel in vacuum.
(b) The number of oscillations per second of a vibrating object is called its time period.
(c) If the amplitude of vibration is large, sound is feeble.
(d) For human ears, the audible range is 20 Hz to 20,000 Hz.
(e) The lower the frequency of vibration, the higher is the pitch.
(f) Unwanted or unpleasant sound is termed as music.
(g) Noise pollution may cause partial hearing impairment.

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

4. Fill in the blanks with suitable words.

(a) Time taken by an object to complete one oscillation is called _____.
(b) Loudness is determined by the _____ of vibration.
(c) The unit of frequency is _____
(d) Unwanted sound is called _____.
(e) Shrillness of a sound is determined by the _____ of vibration.

Ans. (a) Time period (b) amplitude (c) hertz (Hz) (d) noise (e) frequency

5. A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.

Ans. Number of oscillation (n) = 40, time (t) = 4 s

$$\therefore \text{ Time period } (T) = \frac{t}{n} = \frac{4}{40} = 0.1 \text{ s}$$

$$\text{and frequency } (\upsilon) = \frac{1}{T} = \frac{1}{0.1} = 10 \text{ Hz}$$

6. The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of the vibration?

Ans. Given that $\upsilon = 500$, $T = ?$

$$T = \frac{1}{\upsilon} = \frac{1}{500} = 0.002 \text{ s}$$

7. Identify the part which vibrates to produce sound in the following instruments.

(a) *Dholak*
(b) *Sitar*
(c) Flute

Ans. (a) Dholak – Stretched skin (b) Sitar – string (c) Flute – air column

8. What is the difference between noise and music? Can music become noise sometimes?

Ans. Irritating, unpleasant and tiring sounds are called noise. On the other hand, soothing, pleasant and refreshing sounds are called music.

Yes, music becomes noise when we hear it in the high volume which may disturb people.

9. List sources of noise pollution in your surroundings.

Ans. Do yourself.

10. Explain in what way noise pollution is harmful to human.

Ans. Noise pollution is the unwanted and displeasing human created sound that disrupts the environment.

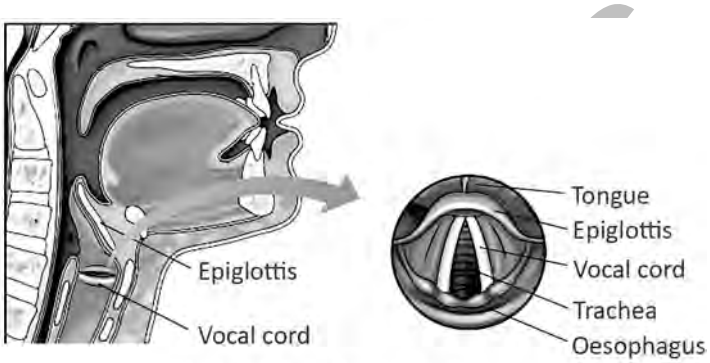
The noise pollution affects both health and behaviour. It can cause annoyance and aggression, hypertension, high stress levels, hearing loss, sleep disturbance and tinnitus. Tinnitus can lead to forgetfulness, severe depression and at times panic attacks. High noise pollution can cause cardiovascular disorders.

11. Your parents are going to buy a house. They have been offered one on the roadside and another three lanes away from the roadside. Which house would you suggest your parents should buy? Explain your answer.

Ans. We would suggest our parents to buy the house three lanes away from roadside because traffic on road is one of the causes of noise pollution.

12. Sketch larynx and explain its function in your own words.

Ans. The sound producing organ of our body is called larynx or voice box. It is located in the throat at the upper end of the windpipe. Inside the voice box, there are two ligaments called vocal cords. When lungs force out air through the larynx, the vocal cords vibrate to produce sound. The muscles attaching the vocal cords can make them loose or tight. This is called changing the tension in the vocal cords. The tension on the vocal cords can change to produce a higher or a lower tone.



Human larynx (voice box)

13. Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later. Can you explain why?

Ans. The speed of sound in air (340 m/s) is very much less than the speed of light in air (3×10^8 m/s). Due to this fact, we always see the lightning much before hearing the thunder.

CHAPTER 14.
CHEMICAL EFFECTS OF ELECTRIC CURRENT

1. Fill in the blanks.

(a) Most liquids that conduct electricity are solutions of _____, _____ and _____.

(b) The passage of an electric current through a solution causes _____ effects.

(c) If you pass current through copper sulphate solution, copper gets deposited on the plate connected to the _____ terminal of the battery.

(d) The process of depositing a layer of any desired metal on another material by means of electricity is called _____.

Ans. (a) acids, bases, salts (b) chemical (c) negative (d) electroplating

2. When the free ends of a tester are dipped into a solution, the magnetic needle shows deflection. Can you explain the reason?

Ans. Yes, the taken sample of solution would be a good conductor of electricity hence, due to magnetic effect of electricity, the magnetic middle shows deflection.

3. Name three liquids, which when tested in the manner shown in Fig. 14.9, may cause the magnetic needle to deflect.

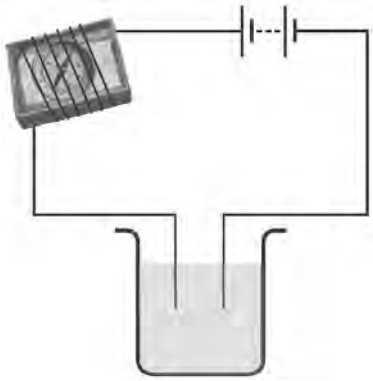


Fig. 14.9

Ans. Tap water, salt solution, lemon juice, etc.

4. The bulb does not glow in the setup shown in Fig. 14.10. List the possible reasons. Explain your answer.

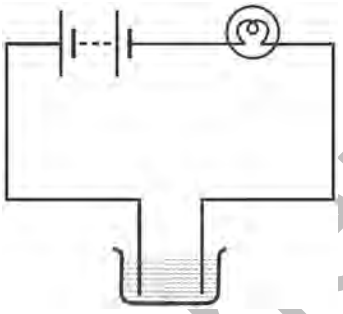


Fig. 14.10

Ans. The possible reasons of not glowing the bulb joined in tester may be:

(i) The sample liquid may be a bad conductor of electricity.
(ii) The bulb may be fused.
(iii) The battery may be discharged.

If the liquid is a bad conductor of electricity or the bulb is fused, then circuit will not be completed, and hence, bulb will not glow. If the battery is discharged, there will be no current in the circuit and the bulb will not glow.

5. A tester is used to check the conduction of electricity through two liquids, labelled A and B. It is found that the bulb of the tester glows brightly for liquid A while it glows very dimly for liquid B. You would conclude that

(i) liquid A is a better conductor than liquid B.
(ii) liquid B is a better conductor than liquid A.
(iii) both liquids are equally conducting.
(iv) conducting properties of liquid cannot be compared in this manner.

Ans. (i)

6. Does pure water conduct electricity? If not, what can we do to make it conducting?

Ans. No, we can mix some table salt, lemon juice or soda in pure water to make it conduct electricity.

7. In case of a fire, before the firemen use the water hoses, they shut off the main electrical supply for the area. Explain why they do this.

Ans. In case of a fire, the firemen involved at the site use impure water to extinguish the fire. The impure water is a good conductor of electricity and it causes electric shocks so they shut off the main electrical supply for the area.

8. A child staying in a coastal region tests the drinking water and also the seawater with his tester. He finds that the compass needle deflects more in the case of seawater. Can you explain the reason?

Ans. Seawater contains more salts as compared to drinking water because drinking water gets purified to remove excess salt. Hence, seawater is a better conductor than the drinking water so the child gets more deflection in compass needle in case of seawater.

9. Is it safe for the electrician to carry out electrical repairs outdoors during heavy downpour? Explain.

Ans. No, it is not safe because rainwater can get slightly acidified as well as it wets the equipments that can cause electric shock.

10. Paheli had heard that rainwater is as good as distilled water. So she collected some rainwater in a clean glass tumbler and tested it using a tester. To her surprise she found that the compass needle showed deflection. What could be the reasons?

Ans. In atmosphere, a plenty of smoke particles is present. They contain many nonmetallic oxides like CO_2, NO_2 SO_2, etc. which mix with rainwater and form acids like HNO_3 (nitric acid), H_2CO_3 (carbonic acid), H_2SO_3 (sulphurous acid) or H_2SO_4 (sulphuric acid). Thus, mixing of acids can cause acid rain, therefore, rainwater gets impure and becomes good conductor of electricity.

11. Prepare a list of objects around you that are electroplated.

Ans. Car parts, taps, kitchenware, gas stove, cutlery, etc., are electroplated.

12. The process that you saw in Activity 14.7 is used for purification of copper. A thin plate of pure copper and a thick rod of impure copper are used as electrodes. Copper from impure rod is sought to be transferred to the thin copper plate. Which electrode should be attached to the positive terminal of the battery and why?

Ans. Impure thick copper rod should be attached to the positive terminal of the battery because when copper sulphate ($CuSO_4$) gets decomposed, the copper (copper ion) gets attracted towards the negative electrode and converting into copper gets deposited here. Further, sulphate part goes to positive electrode and again converts its copper sulphate by decreasing the thickness of impure copper plate.

Chapter 15.
Some Natural Phenomena

Select the correct option in questions 1 and 2.

1. Which of the following cannot be charged easily by friction?
(a) A plastic scale (b) A copper rod (c) An inflated balloon (d) A woollen cloth.

Ans. (b)

2. When a glass rod is rubbed with a piece of silk cloth the rod
(a) and the cloth both acquire positive charge.
(b) becomes positively charged while the cloth has a negative charge.
(c) and the cloth both acquire negative charge.
(d) becomes negatively charged while the cloth has a positive charge.

Ans. (b)

3. Write T against true and F against false in the following statements.
(a) Like charges attract each other.
(b) A charged glass rod attracts a charged plastic straw.
(c) Lightning conductor cannot protect a building from lightning.
(d) Earthquakes can be predicted in advance.

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

4. Sometimes, a crackling sound is heard while taking off a sweater during winters. Explain.

Ans. A crackling sound is heard while taking a sweater off because sweater gets charged electrically on rubbing with our skin.

5. Explain why a charged body loses its charge if we touch it with our hand.

Ans. When we touch a charged body with our hand, the charge flows from that body to our hand because human body behaves as a good conductor of electricity. Thus, the charged body loses its charges.

6. Name the scale on which the destructive energy of an earthquake is measured. An earthquake measures 3 on this scale. Would it be recorded by a seismograph? Is it likely to cause much damage?

Ans. Richter scale. Yes, an earthquake of measure 3 be recorded by a seismograph. No, it will cause no damage.

7. Suggest three measures to protect ourselves from lightning.

Ans. Some important safety measures to protect from lightning are as follows:

When inside

(a) Stay away from doors and windows.
(b) If the thunderstorm is present, do not plug or unplug TVs, telephones, stereos or other electrical appliances.
(c) Stay away from plumbing, avoid running water and do not take a shower or bath.

When outside

(a) If caught outdoors, seek cover indoors as quickly as possible.
(b) Do not stand under a tree for cover because taller and moist objects are more prone to lightning strike.
(c) Do not use an umbrella, lawn mower, bicycle or similar objects.
(d) If caught in an open field, crouch low, with your head bent in between your arms and legs close together.

8. Explain why a charged balloon is repelled by another charged balloon whereas an uncharged balloon is attracted by another charged balloon?

Ans. As the two charged balloon have the similar charges, hence they repel each other. But when an uncharged balloon is brought near a charged balloon, it is induced an apposite charge to itself and hence gets attracted.

9. Describe with the help of a diagram an instrument which can be used to detect a charged body.

Ans. An electroscope is used to detect a charged body. When we touch the metal wire of electroscope with the charged straw, the charge flows through the metal wire to the aluminium strip, as the straw has high level of charge and the metal wire has low (no) charge on it. The two halves of aluminium strip acquire same type of charge from the straw and they separate apart due to repulsion caused by similar charges. The aluminium strip is now charged.

When we touch the metal wire with our hand, charge from the foil strip (high level) flows to the zero level charge on our hand, and therefore, the repulsion experienced by the two halves of strip is vanished.

10. List three states in India where earthquakes are more likely to strike.

Ans. Jammu and Kashmir, Rajasthan and Gujarat

11. Suppose you are outside your home and an earthquake strikes. What precaution would you take to protect yourself?

Ans. We should take the following precautions to protect ourselves:

If we are Driving

(a) Pull over to the side of the road, stop and set the parking brake.
(b) Avoid bridges, power lines, poles, signboards, buildings and trees, as much as possible.
(c) Stay inside the vehicle until shaking stops.
(d) If a power line falls on the vehicle, stay in till a trained person removes it.

If we are Outdoors

(a) Look for a place away from trees, poles, power lines, buildings and hoardings.
(b) Drop to the ground, till the tremors stop.

12. The weather department has predicted that a thunderstorm is likely to occur on a certain day. Suppose you have to go out on that day. Would you carry an umbrella? Explain.

Ans. If it is predicted that a thunderstorm is likely to occur on a certain day and we have to go out on that day, then carrying an umbrella is not a good idea because an umbrella has metallic wires and rods that can cause electric shock during thunderstorm. Also, we have to face a lot of difficulties due to storms.

CHAPTER 16.
LIGHT

1. Suppose you are in a dark room. Can you see objects in the room? Can you see objects outside the room. Explain.

Ans. No, we cannot see the objects kept in a dark room when we are also present in the room. But, we can see the objects outside the room because the light comes from them to our eyes.

2. Differentiate between regular and diffused reflection. Does diffused reflection mean the failure of the laws of reflection?

Ans.

Regular Reflection	Irregular Reflection
1. When a beam of light falls on a smooth and highly polished surface, almost entire light gets reflected in the same medium in a definite direction. This kind of reflection is called regular reflection.	1. When a beam of light falls on a rough and uneven surface, the light gets reflected in different directions, i.e., light rays do not follow uniformity of direction. This kind of reflection is known as irregular or diffused reflection.
2. We can see our image formed by a mirror due to the phenomenon of regular reflection.	2. In case of diffused reflection from rough surfaces, either there is no image formed or a blurred (hazy) image is formed.
3. Regular reflection creates glare and we cannot see the things clearly and comfortably.	3. We are able to see things comfortably because of irregular reflection.

No, diffused reflection does not mean the failure of laws of reflection.

3. Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case.

(a) Polished wooden table
(b) Chalk powder
(c) Cardboard surface
(d) Marble floor with water spread over it
(e) Mirror
(f) Piece of paper

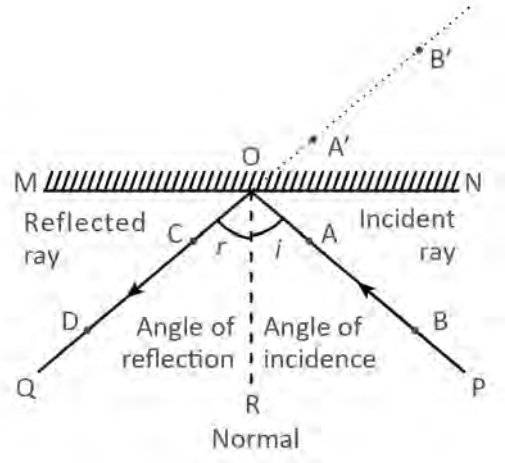
Ans. Regular reflection will take place in case a beam of light strikes on (a) polished wooden table, (d) marble floor with water spread over it and (e) mirror. In these cases, surfaces are too smooth.
Diffused reflection will take place in case of light striking on (b) chalk powder, (c) cardboard surface and (f) piece of paper. In these cases, surfaces are so rough that regular reflection cannot take place.

4. State the laws of reflection.

Ans. When light falls on a plane smooth surface, it follows the laws of reflection. These laws are:
(a) When a ray of light (incident ray) falls on a plane smooth surface, it is reflected in the same medium in such a way that the angle of incidence is equal to the angle of reflection.
(b) The incident ray, the reflected ray and the normal always lie in the same plane.

5. Describe an activity to show that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Ans. Place a white sheet of paper on a drawing board. Take a plane mirror, put it vertically and draw a line MN along the margin of the mirror. Fix two pins A and B at a gap of a few cm apart. They should appear in one line in the mirror. Now, by looking at the reflection of these two pins, fix two pins C and D on the other side in such a way that images of all four pins appear in a straight line. Remove the pins and draw a straight line along the path of AB and CD. The point where these two lines meet, mark it as O. Draw a perpendicular OR. This is called normal. The angle formed by the incident ray (OP) and the normal is called angle of incidence (*i*) and angle formed by the normal and reflected ray (OQ) is called angle of reflection (*r*).



From the figure, it is clear that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

6. Fill in the blanks in the following.

(a) A person 1 m in front of a plane mirror seems to be _____ m away from his image.
(b) If you touch your _____ ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with _____.
(c) The size of the pupil becomes _____ when you see in dim light.
(d) Night birds have _____ cones than rods in their eyes.

Ans. (a) 2 (b) left, left (c) bigger (d) less

Choose the correct option in questions 7-8.

7. Angle of incidence is equal to the angle of reflection.
(a) Always (b) Sometimes (c) Under special conditions (d) Never

Ans. (a)

8. Image formed by a plane mirror is
(a) virtual, behind the mirror and enlarged. (b) virtual, behind the mirror and of the same size as the object.

(c) real at the surface of the mirror and enlarged.

(d) real, behind the mirror and of the same size as the object.

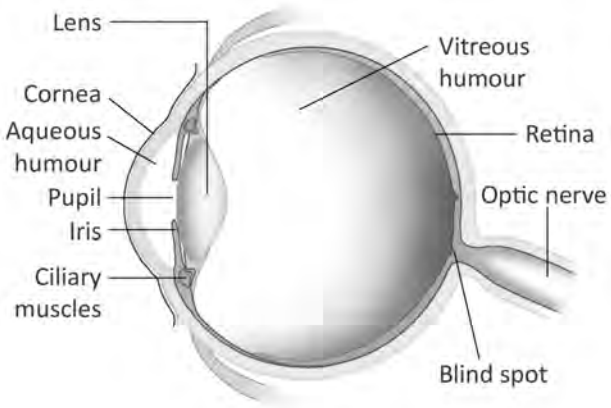
Ans. (b)

9. Describe the construction of a kaleidoscope.

Ans. Take three strips of plane mirrors of equal sizes, say 15 cm long and 4 cm wide. Join the long edges of the mirror strips, with an adhesive tape on their outer side, so that their reflecting surfaces face each other and they form a triangular tube. Close one end of the triangular tube with a small triangular sheet of glass. Paste a piece of butter paper on the outer side of the triangular glass sheet. Put some small coloured objects from its open end, into the tube. These objects may be coloured beads, stars, broken pieces of bangles or plastic toys. Be sure that these coloured objects have enough space to move inside the tube. Finally, close the open end of the tube with a piece of cardboard, having a 2 mm wide hole in its centre. The kaleidoscope is ready. To make it more durable and decorative, you can wrap the sides (only) of your kaleidoscope with a brightly coloured and designed paper. Look through the hole of kaleidoscope with one eye. Rotate the kaleidoscope to see different and new patterns made by coloured objects, due to multiple reflections.

10. Draw a labelled sketch of the human eye.

Ans.



Structure of a human eye

11. Gurmit wanted to perform Activity 16.8 using a laser torch. Her teacher advised her not to do so. Can you explain the basis of the teacher's advise?

Ans. Laser beam is not preferred to human eyes because it can damage the living cells (rods and cones specially). Hence, the teacher advised Gurmit not to perform the activity related to varying the pupil's size in bright and dim light, using a laser torch.

12. Explain how you can take care of your eyes.

Ans. Ways to take care of the eyes:

(a) The eyes should be washed every day with fresh and clean water at normal temperature.

(b) Never rub the eyes.

(c) In case of dust particles get into the eyes, splash a lot of clean and cold water into the eyes so as to wash away the dust.

(d) If a foreign particle like a splinter or a metal particle got into the eyes, wash with clean and cold water immediately. If it does not come out with water, rush to the doctor.

(e) Never look at very bright sources of light like the sun or a welding spark directly.

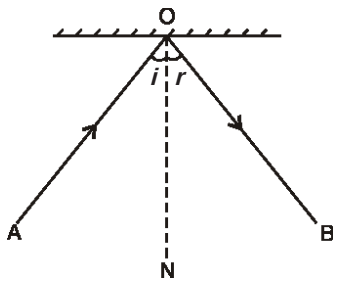
(f) Do not read or write in dim or very bright light and also in a moving vehicle.

(g) While reading or writing, keep your books or notebooks at a distance of distinct vision (25 cm) from the eyes.

(h) Do not spend much time looking at computer screen or a television screen.

13. What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray?

Ans. According to question, angle between incident ray and reflected ray is 90°. Let us sketch a ray diagram to understand it clearly.



Here, $\angle AOB = 90°$ (from question)

$\because \quad \angle AON = \angle BON$ (Law of reflection)

i.e., $\angle i = \angle r$

So, $\angle i + \angle r = 90°$

or $\angle i + \angle i = 90°$

or $2\angle i = 90°$

$\therefore \quad \angle i = \frac{90°}{2} = 45°$

14. How many images of a candle will be formed if it is placed between two parallel plane mirrors separated by 40 cm?

Ans. Infinite images, because the number of images formed by two plane mirrors does not depend upon distance between them. It depends upon the angle between them.
As the angle between two parallel plane mirrors is 0°.
So number of images,

$$= \frac{360^\circ}{\theta} - 1 = \frac{360^\circ}{0} - 1 = \infty - 1 = \infty$$

So, infinite number of images will be formed.

15. Two mirrors meet at right angles. A ray of light is incident on one at an angle of 30° as shown in Fig. 16.19. Draw the reflected ray from the second mirror.

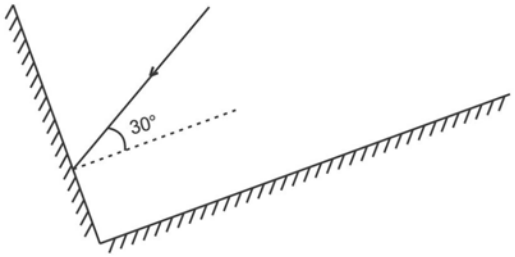
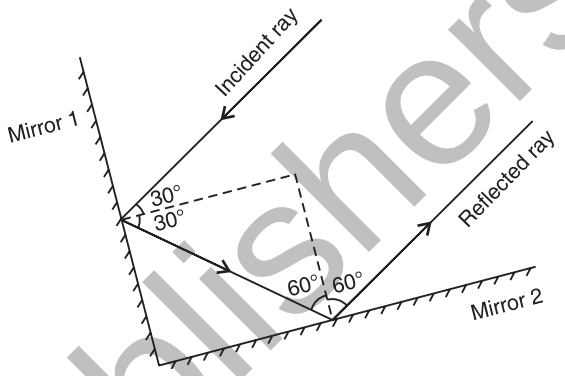


Fig. 16.19

Ans.



16. Boojho stands at A just on the side of a plane mirror as shown in Fig. 16.20. Can he see himself in the mirror? Also can he see the image of objects situated at P, Q and R?

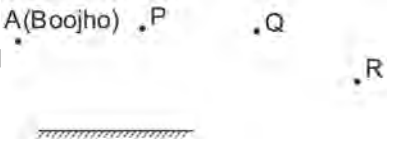
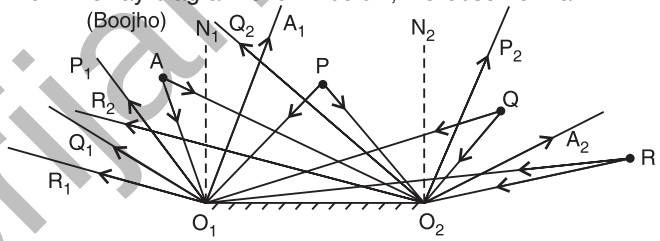


Fig. 16.20

Ans. From the ray diagram shown below, we observe that



- Boojho standing at A cannot see his image himself because reflected rays (as drawn O_1A_1 and O_2A_2 from two ends) go away from him.
- Position of A lies between reflected rays O_1P_1 and O_2P_2 as well as O_1Q_1 and O_2Q_2, hence he can see the images of P and Q only.
- Similar to that of A, reflected rays O_1R_1 and O_2R_2 move away from A so he cannot see R also.

17. (a) Find out the position of the image of an object situated at A in the plane mirror (Fig. 16.21).
(b) Can Paheli at B see this image?
(c) Can Boojho at C see this image?
(d) When Paheli moves from B to C, where does the image of A move?

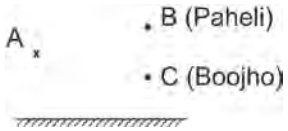
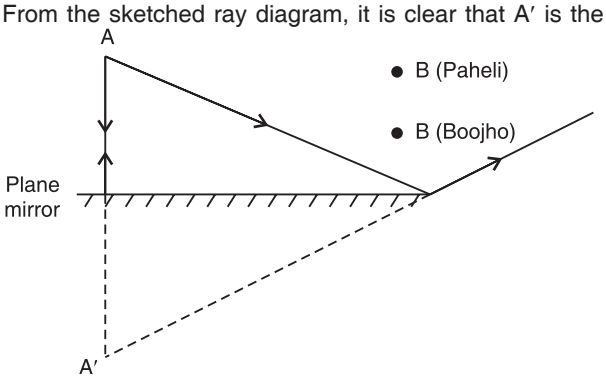


Fig. 16.21

Ans. (a) From the sketched ray diagram, it is clear that A′ is the image of A formed by the given plane mirror.



(b) Yes, B can see this image.
(c) Yes, C can see this image.
(d) Position of A does not change so position of image will also not change when Paheli moves from B to C.

CHAPTER 17.
STARS AND THE SOLAR SYSTEM

Choose the correct answer in questions 1-3.

1. Which of the following is NOT a member of the solar system?
(a) An asteroid
(b) A satellite
(c) A constellation
(d) A comet

Ans. (c)

2. Which of the following is NOT a planet of the Sun?
(a) Sirius
(b) Mercury
(c) Saturn
(d) Earth

Ans. (a)

3. Phases of the moon occur because
(a) we can see only that part of the moon which reflects light towards us.
(b) our distance from the moon keeps changing.
(c) the shadow of the Earth covers only a part of the moon's surface.
(d) the thickness of the moon's atmosphere is not constant.

Ans. (a)

4. Fill in the blanks.
(a) The planet which is farthest from the Sun is _____.
(b) The planet which appears reddish in colour is _____.
(c) A group of stars that appear to form a pattern in the sky is known as a _____.
(d) A celestial body that revolves around a planet is known as _____.
(e) Shooting stars are actually not _____.
(f) Asteroids are found between the orbits of _____ and _____.

Ans. (a) Neptune (b) Mars (c) constellation (d) moon or satellite (e) stars (f) Mars, Jupiter

5. Mark the following statements as true (T) or false (F).

(a) Pole star is a member of the solar system.
(b) Mercury is the smallest planet of the solar system.
(c) Uranus is the farthest planet in the solar system.
(d) INSAT is an artificial satellite.
(e) There are nine planets in the solar system.
(f) Constellation Orion can be seen only with a telescope.

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

6. Match items in column A with one or more items in column B.

A	B
(i) Inner planets	**(a) Saturn**
(ii) Outer planets	**(b) Pole star**
(iii) Constellation	**(c) Great Bear**
(iv) Satellite of the Earth	**(d) Moon**
	(e) Earth
	(f) Orion
	(g) Mars

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

7. In which part of the sky can you find Venus if it is visible as an evening star?

Ans. Venus in visible as an evening star in the western sky.

8. Name the largest planet of the solar system.

Ans. Jupiter.

9. What is a constellation? Name any two constellations.

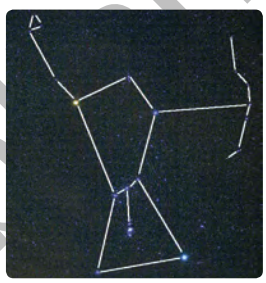
Ans. A group of stars forming a recognisable shape is called a constellation. Two constellations are Ursa Major and Orion.

10. Draw sketches to show the relative positions of prominent stars in

(a) Ursa Major and
(b) Orion

Ans.

Ursa Major



Orion

11. Name two objects other than planets which are members of the solar system.

Ans. (a) Asteroids (b) Comets

12. Explain how you can locate the Pole Star with the help of Ursa Major.

Ans. On a clear moonless night during summer at about 9.00 pm, look towards the northern part of the sky and identify Ursa Major. Look at the two stars at the end of Ursa Major. Imagine a straight line passing through these stars and extend it towards the north direction. This line will lead to a star which is not too bright. This is the pole star. Pole star does not move at all as other stars drift from east to west.

13. Do all the stars in the sky move? Explain.

Ans. No. The Pole Star does not move at all while other stars appear to move from east to west because the Earth rotates from west to east.

14. Why is the distance between stars expressed in light years? What do you understand by the statement that a star is eight light years away from the Earth?

Ans. The distance between stars is expressed in light years because to express large distances, bigger units are used.
The given statement means that the distance between the Earth and the star is equal to the distance covered by light in eight years, with the speed of 3,00,000 kilometres per second.

15. The radius of Jupiter is 11 times the radius of the Earth. Calculate the ratio of the volumes of Jupiter and the Earth. How many Earths can Jupiter accommodate?

Ans. Let the radius of the Earth be R_1

As per question, radius of Jupiter = 11 R_1

Radio of volumes = $\frac{\text{Volume of Jupiter}}{\text{Volume of Earth}} = \frac{\frac{4}{3}\pi \times (11R_1)^3}{\frac{4}{3}\pi \times R_1^3} = \frac{\frac{4}{3}\pi \times 1331\, R_1^3}{\frac{4}{3}\pi \times R_1^3} = 1331$

Hence, Jupiter can accommodate 1331 Earths.

16. Boojho made the following sketch (Fig. 17.29) of the solar system. Is the sketch correct? If not, correct it.

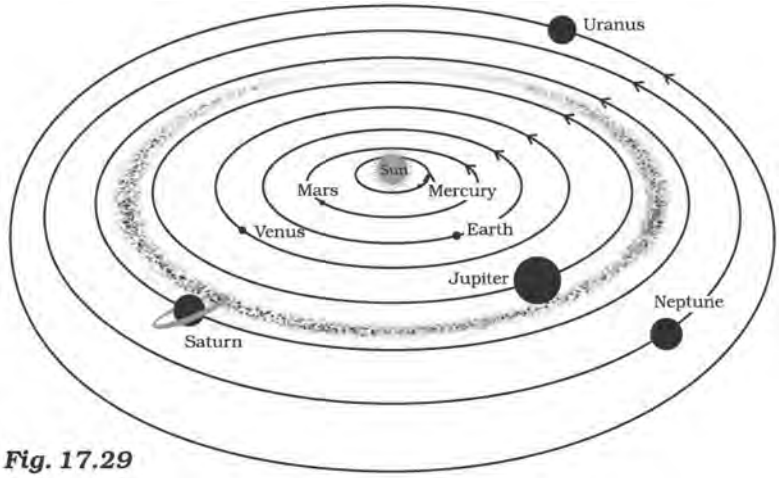
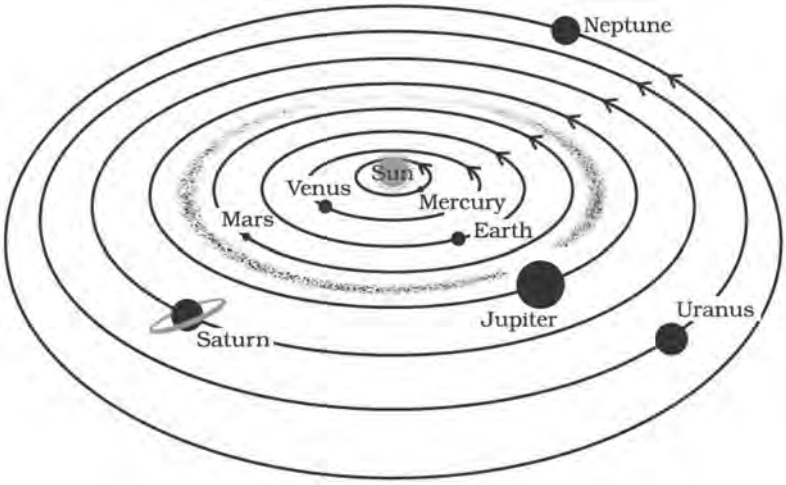


Fig. 17.29

Ans.



CHAPTER 18.
POLLUTION OF AIR AND WATER

1. What are the different ways in which water gets contaminated ?

Ans. The major causes of water pollution are:
(a) Mixing of untreated sewage in water.
(b) Release of toxic wastes from factories directly into waterbodies.
(c) Washing away of fertilisers by rain into waterbodies.
(d) Mixing of human excreta with water.

2. At an individual level, how can you help reduce air pollution?

Ans. To reduce air pollution at an individual level, we should use less polluting fuels like CNG and LPG instead of diesel and petrol. Also, we should use public transport instead of private transport and create awareness about the same among others by various ways like organising debate, quiz, street play, poster making competition, etc.

3. Clear, transparent water is always fit for drinking. Comment.

Ans. Clear, transparent water is always fit for drinking because this water is free from impurities and germs. As a result, there is no possibility of spreading any kind of waterborne disease.

4. You are a member of the municipal body of your town. Make a list of measures that would help your town to ensure the supply of clean water to all its residents.

Ans. The measures taken in order to ensure the supply of clean water to all the residents are:

(a) Be alert in order to purify the water through water treatment plant before supplying it to the residents.
(b) Ensure that people do not contaminate water in waterbodies.
(c) Ensure that sewage water does not mix with the purified water.
(d) Ensure that pipeline supplying water to the residents is not broken or leaking.

5. Explain the differences between pure air and polluted air.

Ans. Pure air does not contain any harmful substances while polluted air contains smoke, poisonous gases, germs, etc. Polluted air is harmful to living beings.

6. Explain circumstances leading to acid rain. How does acid rain affect us?

Ans. Air pollutants like sulphur dioxide and nitrogen dioxide, emitted from vehicles, factories, power plants, etc., get mixed with the air. Sulphur dioxide and nitrogen dioxide react with oxygen and water vapour present in the air to form sulphuric acid and nitric acid, respectively. These acids dissolve in rainwater and fall on the earth. Rain with acids dissolved in it is called acid rain.

Acid rain affects us in many ways:

(a) It contaminates lakes, rivers, etc., which may kill fishes and other creatures living in the water.
(b) It damages the leaves of trees, plants, etc.
(c) It damages the buildings, monuments, statues (especially made of marble and limestone).
(d) It cuases health hazards to humans.
(e) It makes soil acidic which reduces its fertility.
(f) It causes damage to steel bridges, railway lines, etc. Metals may also get corroded.

7. Which of the following is not a greenhouse gas?

(a) Carbon dioxide (b) Sulphur dioxide (c) Methane (d) Nitrogen

Ans. (d)

8. Describe the 'Green House Effect' in your own words.

Ans. Burning of fuels like coal, petrol, diesel, etc., releases carbon dioxide in the air. With an alarming rise in industries, factories, vehicles on roads, etc., more fuel is burnt today. As a result, an extra amount of carbon dioxide is entering the atmosphere every day. Carbon dioxide allows the sun's rays to reach the earth's surface but prevents the heat given out by the ground from escaping. This results in the warming of the earth's surface. The warming of the earth's surface due to trapping of sun's heat by carbon dioxide present in the earth's atmosphere is called greenhouse effect.

9. Prepare a brief speech on global warming. You have to deliver the speech in your class.

Ans. The increase in the average temperature of the earth is termed as global warming. Global warming is caused due to the greenhouse effect of excess amount of carbon dioxide gas in the atmosphere. Actually, carbon dioxide gas allows the solar radiation to reach the earth's surface but it does not allow the heat reflected by earth to escape. This increases the temperature of the earth. Due to global warming, the polar ice caps and snow on the mountains is melting on a faster rates. This extra amount of water is raising the sea level causing threat to low-lying coastal areas to get submerged.

10. Describe the threat to the beauty of the Taj Mahal.

Ans. The Taj Mahal is made of white marble and is known for its beauty. But, the beauty of the Taj is facing the risk of vanishing as its white colour is turning yellowish. This discolouration has resulted due to air pollution around the Taj Mahal. The industries located in and around Agra and the petroleum refinery at Mathura release air pollutants like sulphur dioxide and nitrogen dioxide which dissolve in water, forming acids. The gases released from the petroleum refinery at Mathura are the main cause of acid rain around the Taj Mahal. When the acid-containing rain showers the Taj Mahal, acids corrode the marble, making it weak and yellowish.

11. Why does the increased level of nutrients in the water affect the survival of aquatic organisms?

Ans. Due to excessive nutrients in water, the algae grow fast and cover the entire surface of waterbody. As a result, sunlight does not reach the green plants below algae. This results in the death of aquatic plants. Even when these algae die, the bacteria use a lot of oxygen present in water to decompose them. This results in the lack of dissolved oxygen in the water causing aquatic organisms to die.

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