Chapter 19. Pollution of air and water Living science question with answer

A. MULTIPLE-CHOICE QUESTIONS: Choose the most appropriate answer.

1. Which of these causes water pollution?

a. sewage b. industrial waste c. fertilizers and pesticides d. all of these

2. Which of these processes cannot remove germs from water?

a. boiling b. filtration through porous pot c. reverse osmosis d. exposure to ultraviolet light

3. Which of these methods does not result in conservation of water?

a. using drip irrigation b. recycling of water

c. cutting vegetation so that less water is lost by transpiration d. planting more trees

4. Which of the following is not a pollutant unless present in excess?

a. sulphur dioxide b. carbon dioxide c. carbon monoxide d. nitrogen dioxide

5. Which of the following gases combines with the blood and prevents it from carrying oxygen?

a. carbon monoxide b. carbon dioxide c. nitrogen oxide d. nitrogen trioxide

6. Which of these can cause acid rain?

a. carbon monoxide b. carbon dioxide c. sulphur dioxide d. nitrogen

Ans : 1. d 2.b 3.c 4. b 5. a 6. c

B. VERY SHORT-ANSWER QUESTIONS: Give one-word answers.

1. Water is a renewable resource. By which process is water recycled in nature?

2. The substances that pollute water or air are called _____.

3. Sewage that is _____(treated/untreated) causes water pollution.

4. Hot water discharge into rivers from factories is also a pollutant. True or false?

5. Give one word for 'enrichment of water of a lake or pond by nutrients that leads to excessive plant growth'.

6. Can you safely drink potable water?

7. Name the kind of light that can kill germs.

8. Using less water and preventing water from getting polluted is called of water.

9. Which polluting gas prevents the blood from carrying oxygen?

10. Carbon dioxide is the only greenhouse gas. True or false?

11. Chlorofluorocarbons damage the layer in the atmosphere.

12. What is rain mixed with sulphuric acid or nitric acid called?

13. Which compound added to petrol to prevent engines from 'knocking' causes pollution of air?

14. Name one fuel that causes very little pollution.

Ans : 1. water cycle 2. pollutants 3. untreated 4. True 5. eutrophication 6. Yes

7. ultraviolet light 8. conservation 9. carbon monoxide 10. False 11. ozone 12. acid rain

13. lead 14. Compressed Natural Gas (CNG)

C. SHORT-ANSWER QUESTIONS (TYPE I): Answer in a sentence or two.

1. What harm can dumping of untreated sewage into a river cause?

Ans : Untreated sewage from homes is often disposed off into rivers. These wastes contain many harmful microorganisms - bacteria, viruses, fungi and parasites that cause diseases such as diarrhoea, dysentery, cholera, typhoid and jaundice.

2. Why is hot water discharge into rivers also considered as a cause of water pollution?

Ans : The temperature of the waste water from factories that is discharged into rivers is often higher than the temperature of the river water. The resultant increase in the river water temperature is itself a form of pollution as it adversely affects aquatic plants and animals.

3. If water is filtered, it becomes free of all suspended impurities and hence potable. Do you agree? Give reasons.

Ans : I don't agree with statement that filtered water is potable because only solid impurities are filtered, it may still have germs in it and hence, not potable.

4. Suggest two methods by which water can be made potable at home.

Ans : At home, water can be made potable by killing the germs in the following ways:

(i) Boiling: Boiling the water for 15-20 minutes kills all germs.

(ii) Purifier with ultraviolet light: A special type of light called ultraviolet light kills germs. It is used in several water purifiers available in the market today.

5. What are the main causes of water pollution?

Ans : The main causes of water pollution are: (i) Sewage (ii) Industrial waste (iii) Fertilizers and pesticides

6. The use of CNG instead of diesel is being encouraged these days in vehicles. Why?

Ans : CNG (Compressed Natural Gas) reduces the emission of carbon particles and harmful gases such as carbon monoxide. It has now become compulsory for all commercial vehicles in Delhi to use CNG. This has reduced the pollution in the city.

7. What is the function of a catalytic converter?

Ans : To prevent vehicular pollution, new cars are fitted with a special system called catalytic converter. It can change harmful exhaust gases like carbon monoxide and nitrogen dioxide into harmless carbon dioxide, nitrogen and water.

8. Name three greenhouse gases.

Ans: Carbon dioxide, methane and nitrous oxide.

9. What should be done to reduce water pollution due to sewage and industrial waste?

Ans : Treating sewage and factory wastes before disposing them off so that water sources are not polluted.

SHORT-ANSWER QUESTIONS (TYPE II): Answer in about 30 words.

1. Rivers have always been used to dump waste. How is it that pollution of rivers is becoming more alarming now than it was earlier?

Ans : With an ever increasing human population and an increasing number of industries, the amount of waste which goes into the water is very high. Therefore, the natural process of decay of the wastes can not cope with the amount of waste dumped.

2. What are the cause and effects of eutrophication?

Ans : Excessive run off of fertilizers into water sources results in an increase in nutrients in water. This though a chain reaction leads to excessive plant growth and depletion of oxygen in water. The condition is known as eutrophication. It adversely affects the water plants and animals.

3. Give four methods of conserving water.

Ans : Some of the methods of water conservation are as follows: (i) Using less water and avoiding wastage at home. (ii) Using better methods of irrigation. (iii) Recycling of water in factories and using it several times before it is disposed off. (iv) Treating sewage and factory wastes before disposing them off (v) Water harvesting of rainwater to raise the groundwater level

4. What is SPM? What harm does SPM pollution cause?

Ans : Minute solid particles suspended in air are known as suspended particulate matter or SPM. Unburnt carbon particles given out during the burning of fuels or from the exhausts of vehicles, and fine particles of cement given out

from a cement factory are examples of SPM. The finer of these particles cannot be filtered by the hair in our noses and hence are a major cause of lung diseases. They also settle on plants and interfere with photosynthesis.

5. Why is carbon monoxide considered to be such a dangerous pollutant?

Ans : Carbon monoxide is one of the most dangerous pollutants. It is extremely poisonous. It mixes with the blood and prevents it from carrying oxygen. It can even cause death due to lack of oxygen.

6. Carbon dioxide in air is essential as plants use it to make food. When does it become a pollutant? What damage does it cause?

Ans : Carbon dioxide is produced whenever any fuel is burnt in homes and factories, or by automobiles. Carbon dioxide itself is not a pollutant. However, since so much fuel is being burnt today, the carbon dioxide content in the air is increasing. Also deforestation reduces the number of trees, which utilize carbon dioxide from air during photosynthesis. This also contributes to increasing the percentage of carbon dioxide in the air. Excess carbon dioxide in the atmosphere traps the heat of the sun. This is called the greenhouse effect. This is believed to cause an increase of the temperature of the earth, called global warming.

7. What is acid rain? What is it caused by?

Ans : Rain mixed with sulphuric acid is called acid rain. Sulphur is present in coal as an impurity. Therefore, when coal is burnt in homes, factories or power plants, sulphur dioxide is given off. Sulphur dioxide is poisonous. It affects our lungs. It combines with the oxygen in the air to form sulphur trioxide (SO_3). This reacts with water in the clouds to form sulphuric acid (H_2SO4.).

8. Give four ways in which air can be conserved.

Ans : Some of the methods of air conservation are as follows: Planting of trees is important for reducing air pollution. (ii) Use of efficiently designed smokeless stoves. (iii) Use of smokeless fuels such as LPG and CNG. v) Fitting cars with a special system called catalytic converter to prevent vehicular pollution. (v) Using electrostatic precipitators to remove particles of solid such as carbon from waste gases before they are let out into the atmosphere.

E. LONG-ANSWER QUESTIONS: Answer in about 60 words.

1. How does the use of excess of fertilizers and pesticides affect water bodies?

Ans : Fertilizers and pesticides get washed off by rain into water sources. They also seep into the ground to pollute groundwater. When fertilizers run off into water sources, they cause an increase in the growth of algae in water which use up the dissolved oxygen from the water. When algae die, they become food for decomposers such as bacteria — these also use the dissolved oxygen, thus reducing oxygen content even further. Their thick growth also stops sunlight from reaching the water. This adversely affects the water plants and animals.

2. Discuss the different methods available to us for making water potable by killing germs.

Ans : Water can be made potable by any of the following methods:

(i) Boiling: Boiling the water for 15 - 20 minutes kills all germs.

(ii) Ultraviolet light: A special type of light called ultraviolet light kills germs.

(iii) Reverse osmosis: Water is passed through a semi-permeable membrane. It has fine pores through which water can pass but not the solid impurities and the germs.

(iv) Chlorination: Chlorine added to water in the form of chlorine tablets or bleaching powder kills germs.

3. How is water treated at the waterworks to make it potable?

Ans : ap water supplied to our homes is made potable in the waterworks.

The, processes used are as follows:

(i) Sedimentation and decantation is first done to remove larger particles of solid impurities.

(ii) Alum is then added to the water to separate the smaller particles by making them heavier so that they settle down,

(iii) The water is then filtered by passing it through sand filters.

(iv) Germs are killed by adding chlorine to the water, that is, by chlorination.

4. List the main pollutants of air, and give the ill effects of each.

Ans: The main pollutants of air and their effects are as follows: Suspended Particulate Matter (SPM): These are minute solid particles suspended in air. The finer of these particles cannot be filtered by the hair in our nose and hence are a major cause of lung diseases.

(ii) Carbon monoxide: Carbon monoxide is one of the most dangerous pollutants. It is extremely poisonous. It mixes with the blood and prevents it from carrying oxygen.

(iii) Excess carbon dioxide: Excess carbon dioxide in the atmosphere traps the heat of the sun. This is believed to cause an increase in the temperature of the earth. This can cause large scale melting of ice in the polar regions and also expansion of ocean water. This ultimately can lead to flooding of coastal areas by sea water.

(iv) Sulphur dioxide and Nitrogen dioxide: Sulphur dioxide is poisonous. It affects our lungs. This gas reacts with water to form sulphuric acid, and this gives rise to acid rain. Nitrogen dioxide is also poisonous. It irritates the eyes and affects the lungs.

(v) Chlorofluorocarbons (CFCs): These can damage the ozone layer in the atmosphere, causing an increase in the amount of ultraviolet rays from the sun reaching the earth. This light causes damage to our eyes and skin.

(vi) Lead: Lead compounds cause various problems such as mental disorder and brain damage.

HOTS QUESTIONS: Think and answer.

1. Do you think acid rain also affects crops?

Ans : Yes, acid rain also affects crops.

2. Air pollution in Delhi improved after CNG was introduced instead of diesel in public transport since CNG gives out less smoke. Introduction of the Metro in Delhi is also expected to reduce pollution. How?

Ans : Metro in Delhi will reduce use of number of buses and other vehicles, thus help in the using of less fuels which cause pollution. Also the Metro trains run on electricity and do not cause pollution.

3. What kind of groundwater is more likely to be polluted—that found near the surface of the earth or that found deeper?

Ans : Groundwater found near the surface of the earth is more likely to be polluted than that found deeper.

4. Aforestation leads to both air and water conservation, as well as soil conservation. How?

Ans : Plants slow down the speed of water flowing over land and hence improve its absorption by the soil. This increases the level of groundwater. Plants absorb excess carbon dioxide and give out oxygen. So they also help in reducing air pollution. Thus Aforestation leads to both air and water conservation. Again this leads to conservation of soil as roots of plants hold the soil and prevent its erosion.

5. Does potable water mean pure water without any impurities?

Ans: Yes, potable water means pure water without solid impurities and also without germs.