

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

**Sol.** Water gets contaminated by the addition of:

- (i) Agricultural chemicals: Farmers use excessive amounts of pesticides and fertilizers to increase crop production. These chemicals get carried away to the water bodies due to rains and floods which lead to water pollution.
- (ii) Industrial wastes: Industries release harmful chemical wastes into water sources, thereby polluting them.
- (iii) Sewage wastes: Waste materials from kitchens, toilets, and laundry sources are also responsible for contaminating water.

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

**Sol.** An individual can reduce air pollution by:

- (i) Avoiding the use of cars as much as possible and by using public transport whenever possible.
- (ii) By not using vehicles for short distances.
- (iii) By using clean fuels such as LPG and CNG instead of diesel and petrol.
- (iv) Always disposing the garbage properly and not burning it.
- (v) Controlling the emissions from vehicles and household chimneys.

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

**Sol.** No. Clear and transparent water is not always fit for drinking. Water might appear clean, but it may contain some disease causing micro-organisms and other dissolved impurities. Hence, it is advised to purify water before drinking. Purification can be done by water purifying systems or by boiling the water.

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.

**Sol.** To ensure the supply of clean water to all residents the following steps must be taken:

- (i) The main water source must be built in clean surroundings and should be maintained properly.
- (ii) Chemical methods such as chlorination must be used for purifying water.
- (iii) The area around water pipes must also be clean.

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

**Sol.** Pure air contains around 78% nitrogen, 21% oxygen, and 0.03% carbon dioxide. Other gases such as argon, methane, ozone, and water vapours are also present in small quantities. When this composition of air is altered by the addition of harmful substances or gases such as nitrogen dioxide, sulphur dioxide, carbon monoxide, and particulate matter, then the air is said to be polluted.

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

**Sol.** Burning of fossil fuels such as coal and diesel releases a variety of pollutants such as sulphur dioxide and nitrogen dioxide into the atmosphere. These pollutants react with water vapours present in the atmosphere to form sulphuric acid and nitric acid respectively. These acids come down with the rain, thereby resulting in acid rain.

Effects of acid rain:

- (i) Acid rains damage crops.
- (ii) Acid rains corrode buildings and structures especially those made of marble such as Taj Mahal.

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

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

**Sol.** (d) Nitrogen

8. Describe the 'Greenhouse Effect' in your own words.

**Sol.** Greenhouse effect may lead to global warming, i.e., an overall increase in the average temperature of the Earth. Greenhouse effect is caused by greenhouse gases. Examples of greenhouse gases include carbon dioxide, methane, and water vapour. When solar radiations reach the Earth, some of these radiations are absorbed by Earth and then released back to the atmosphere. Greenhouse gases present in the atmosphere trap these radiations and do not allow heat to leave. This helps in keeping our planet warm and thus, helps in human survival. However, an indiscriminate increase in the amount of greenhouse gases can lead to excessive increase in the Earth's temperature leading to global warming.

9. Prepare a brief speech on global warming. You have to deliver the speech in your class.
- Sol.** Global warming is an increase in the average temperature of the Earth's surface. It occurs as a result of an increased concentration of greenhouse gases in the atmosphere. The greenhouse gases include carbon dioxide, methane, and water vapour. These gases trap solar radiations released back by the Earth. This helps in keeping our planet warm and thus, helps in human survival. However, an increase in the amount of greenhouse gases can lead to an increase in the Earth's temperature leading to global warming.
10. Describe the threat to the beauty of the Taj Mahal.
- Sol.** Acid rain is a major threat to the beauty of the Taj Mahal. When acid rains fall on the monument (that is completely made of marble), they react with marble to form a powder-like substance that is then washed away by the rain. This phenomenon is known as marble cancer. Also, the soot particles emitted from the Mathura oil refinery located near Agra is leading to the yellowing of the marble.
11. Why does the increased level of nutrients in the water affect the survival of aquatic organisms?
- Sol.** An increase in the level of nutrients in a water body leads to an excessive increase in the population of algae in the water body. When these algae die, they serve as food for decomposers. A lot of oxygen is utilised in this process, consequently leading to a decrease in the level of oxygen dissolved in the water body. This in turn causes fishes and other aquatic organisms to die.