Pollution Of Air And Water 18

IN THIS CHAPTER

- *How does air get polluted ?*
- *The Bhopal gas tragedy*
- *Natural sources of air pollution*
- *Effects of air pollution*
- *Effect of pollution on health*
- *Polluted air can cause acid rain*
- *What is greenhouse effect?*
- *What causes global warming?*
- *Effects of global warming*
- *The ozone layer and chlorofluorocarbons*
- *Potable water*
- *Chemical contamination of water*
- *Effects of chemical polutants*
- *Purification of water*
- *Chemical purification of water*

INTRODUCTION

The landscape, these days has turned dry and barren in many places. The wild herbs, the berry shurbs and the song of birds have all vanished. The human actions have poisoned the air, soil and water all around us. This is not an isolated incident. A beautiful lake turning lifeless or a lush green hill turning barren or thousands of dead fish being washed to the seashore are common incidents these days. Most of such incidents are caused due to polluted air, water and soil. Read on to know more about the greatest problem of today.

Living things originated and survived on the earth because :

All the materials required by living things, such as air, water, soil and minerals are present on the earth. These are the major resources of the earth.

The earth is at the right distance from the sun and therefore has the right temperature range for life to exist. The light energy received from the sun plays an important role in the survival of life on the earth.

Plants use carbon dioxide from the air, water and minerals from the soil, and sunlight to make food for themselves and other habitats of the earth.

Animals need oxygen, water and food to survive. We, human beings get oxygen from the air, water from the water bodies such as ponds, lakes and rivers, and food from plants and animals.

What is Air Pollution?

Air is a mixture of nitrogen, oxygen, carbon dioxide, argon and neon gases in definite amount. It also contains some dust particles, microorganisms and water vapour.

Human action have disturbed the natural composition of air. Several harmful chemicals and particulate matter (fine particles of lead metal, carbon, cement and coal) are added into the air. These substances have made air impure. Air which contains unwanted and harmful substances is known as polluted air.

How does Air Get Polluted?

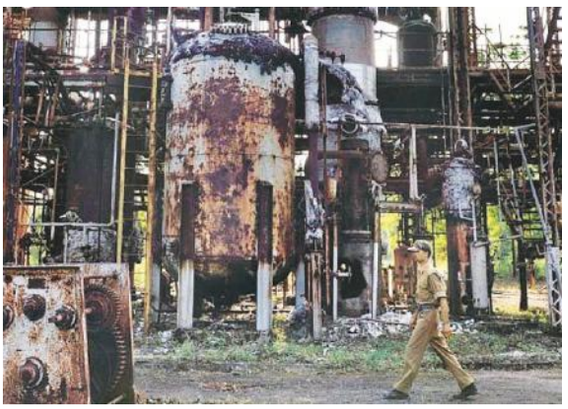
Air is polluted mainly due to excessive use of fossil fuel such as diesel, petrol, kerosene and coal. Fossil fuel are burnt by industries, motor vehicles and for household purposes. When these fuels burn, they produce gases such as carbon dioxide, carbon monoxide, sulphur dioxide, nitrogen oxides and soot. These are some of the major pollutants of air. Burning of garbage that contains plastics and rubber also releases poisonous fumes into the air.

Thermal power plants burn huge quantities of coal to produce electricity. Almost 90% of sulphur dioxide in the air comes from burning of coal mostly by the thermal power plants.

Air pollutants also come from other sources. Industries produce thousands of chemicals as waste products. Some of these are released into the air. Industries producing chemicals, plastics and fertilizers are highly polluting, that is why when you pass by these industries the air smells foul and acidic. Decomposing organic matter also add pollutants into the air. Decomposing garbage in landfills and solid waste disposal sites emit methane gas which pollutes air.

Accidents in chemical industries and nuclear power plants can add huge amounts of harmful substances in the air in a short period of time. The Bhopal gas tragedy was one such tragic accident.

The Bhopal Gas Tragedy



The accident occurred at the Union Carbide India Limited, plant at Bhopal, Madhya Pradesh, in the early morning hours of December 3, 1984. Water was accidentally added to a tank containing a highly poisonous substance called methyl isocyanate (MIC). The reaction overheated the tank and released large volumes of extremely poisonous gas into the atmosphere killing several thousands people and seriously affecting many more.

Natural Sources of Air Pollution

Air is occasionally polluted naturally by dust storms add plenty of fine dust particles to the air. Forest fires add carbon dioxide, carbon monoxide, nitrogen oxides and sulphur oxides into the atmosphere. A large volcanic eruption adds huge amounts of sulphur dioxide and volcanic ash to the air.

The 1991 volcanic eruption of Mount Pinatubo in the Philippines, dumped so much volcanic ash into the upper atmosphere that it blocked light and heat reaching the earth and lowered the earth's temperature for the next two years.

Do You Know ?

Fiborsis of the lung can be caused by inhalation of small particulates over long periods, resulting in a disease called pneumoconiosis.

Effects of Air Pollution

Polluted air affects human being and other living things.

Most living things need clean air to live. Most plants and land animals obtain air directly from the atmosphere. Polluted air affects human health. it mainly affects the respiratory system and causes respiratory problems. Some air pollutants can even cause death. For example, carbon monoxide produced by the incomplete combustion of diesel quickly binds to the red blood cells and prevents oxygen from binding to them. This prevents blood from transporting enough oxygen to the body including the brain leading to the death of a person.

Asbestosis is a serious lung disorder. It is caused by asbestos fibre present in the air. These fibres when inhaled can also cause lung cancer.

Effect of Pollution on Health

Sulphur dioxide (SO_2)	Heart diseases, respiratory problems, cancer, irritation in the eye and headache
Nitrogen oxide (NO_2)	Lungs irritation and chest pain
Carbon monoxide (CO)	Unconsciousness and death
Lead (Pb)	Decreased haemoglobin in blood, damage to the nervous system and kidneys.

Polluted Air Can Cause Acid Rain

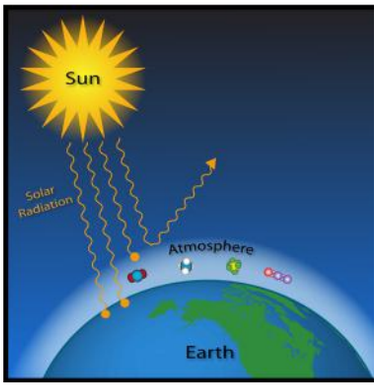
Burning of fossil fuels besides other things adds sulphur dioxide and nitrogen oxides into the atmosphere. When air is polluted by at least one of these gases in large amounts, it causes acid rain. Sulphur dioxide reacts with water and produces sulphuric acid. Similarly, nitrogen oxide reacts with water and produces nitric acid. Both these are strong acids. Therefore, they are highly corrosive. Acid rain corrodes stone structures and buildings, damages crops and forests. It makes lakes and streams acidic and unsuitable for aquatic plants, fish and other animals.

Sulphur dioxide + Water — Sulphuric acid

Nitrogen oxide + Water — Nitric acid

Acid rain can affect large areas. Wind can carry air containing sulphur and nitrogen oxides to far away places and affect places which otherwise have cleaner air. For example, the southern parts of Norway do not have any large industries, still most of its lakes have turned acidic because of acid rain.

What is Greenhouse Effect?



The earth is surrounded by a natural of layer of gases. These gases keep the earthworm. The gases that form this layer are known as greenhouses gases. Water vapour, carbon dioxide, carbon monoxide, ozone, nitrogen oxide and methane are some of the greenhouse gases. Without this layer of gases, the earth would have been freezing cold, and life would not have existed in its present form. Warming of the earth by the layer of gases is known as greenhouse effect.

What Causes Global Warming?

The earth receives heat from the sun. When the surface of the earth heats up, it radiates some of the heat towards the space. The layer of green house gases that surrounds the earth does not allow all heat to leave the earth's atmosphere. it traps some of this heat, which keeps the earth warm.

Human actions have been adding greenhouse gases into the atmosphere all the time. Some scientists believe that the layer of greenhouse gases that traps heat has increased. Therefore, more heat is being retained in the earth's atmosphere, thus raising the earth's average temperature. The rise in the earth's average temperature is called global warming.

Thus, by adding more and more greenhouse gases, we could be disturbing the natural process that keep the earth ideally warm. This can lead to global warming.

EFFECTS OF GLOBAL WARMING

Scientist predict that global warming will change the earth's climate. A change in the earth's climate would :

Affect Agriculture and Food Production

Melt ice in the polar regions and increase the sea level. This would submerge low lying coastal regions and islands.

Melt ice on mountains, thereby permanently depriving rivers like the Ganga and Brahmaputra of fresh supply of water. This would lead to gradual drying up of the river.

Increase rainfall and occurrence of floods in some regions.

Cause frequent droughts in some other regions.

Lead to warmer weather. This may cause the spread of diseases caused by micro-organisms.

What can we do to prevent air pollution and global warming ?

Any further increase in greenhouse gases in the atmosphere can further increase the average temperature of the earth. To prevent global warming, we must reduce the use of fossil fuels which add greenhouse gases in the atmosphere. Fossil fuels are used to run motor vehicles and thermal power plants to produce electricity. Therefore, steps should be taken to minimise the use of vehicles or electricity would reduce emission of greenhouse gases. A few such measures are mentioned below.

Adopt a Simple Lifestyle

Use public transport more often. Do not use vehicles for short distances.

Service your motor vehicles regularly. Maintain proper air pressure in the tyres. This will reduce consumption of fuel.

Do not leave fans, bulbs, television, computers, music system, water heater or any other electric appliance on when not in use. Use mobile phones only when necessary. use energy saving compact fluorescent bulbs (CFL).

As far as possible Use local goods. Transporting goods from elsewhere uses fuel.

Use fresh fruits and vegetables, thereby saving electricity to keep food frozen.

Plants use carbon dioxide which is a greenhouse gas. Grow more trees and plants. Use recycled paper to save trees.

The Ozone Layer and Chlorofluorocarbons

The earth's atmosphere is mixture of many gases. It also contains ozone (O_3) gas. Ozone is made up of oxygen atoms. There is a layer of ozone in the upper regions of the atmosphere between 14 km and 40 km above the earth's surface.

The sun emits ultraviolet rays, which are harmful to all kinds of life forms from micro-organisms to human beings. The ozone layer absorbs the ultraviolet rays of the sun and prevents them from reaching the earth. This protects life on the earth.

Chlorofluorocarbons (CFCs) Damage the Ozone Layer

Chlorofluorocarbons (CFSs) are chemicals containing chlorine, fluorine and carbon. They are used in refrigerators and air conditioners, in making certain foam plastics used for packaging and in cans containing spray paints, insect repellents and deodorants. These chemicals get released into the atmosphere as gases. The CFCs in the atmosphere react with ozone and decrease the amount of ozone in the atmosphere. If the layer of ozone that protects the earth from the sun's harmful ultraviolet radiations decreases, it will harm life on the earth.

What can be done to Prevent CFCs from Damaging the Ozone Layer?

Reduce the use of foam plastics for packaging.

Reduce the use of deodorants.

Minimise the use of technology that uses CFS-based chemicals.

Potable Water

Water that can be safely used for human consumption is called potable water. For water to be fit for human consumption, it should be free from imcro-organisms, should not contain any harmful substance or dissolved matter beyond a certain limit. High amount of particles even of harmless substances make water less suitable for human consumption. For example, a high amount of fine sand in fresh water makes it unsuitable for drinking.

How does Water Get Polluted?

Water is an excellent solvent and various kinds of substances readily dissolve in it. Micro-organisms grow rapidly in water, if it contains organic matter. Due to these two properties of water, micro-organisms and chemicals easily pollute water.

Biological Contamination of Water

Biologically-contaminated water contains organic waste and harmful micro-organisms that can cause diseases. Water gets biologically contaminated mainly when large amounts of organic waste from farms and homes is allowed to flow directly into rivers, lakes and oceans. This happens because many smaller towns and most villages of India are not yet connected to sewage treatment plants.

Drinking water can also get contaminated through improper handling. We must store water in a clean container. Care must be taken to ensure that water is handled with clean hands and utensils. The Indian method of removing water with a special utensil having a long handle is one of the best ways of handling drinking water.

Effects of Biologically Contaminated Water on Human Health

Biologically contaminated water contains disease-causing micro-organisms. These micro-organisms can cause typhoid, cholera and intestinal infections. Biological contamination of water occurs more often in regions where sanitation is inadequate.

Dumping untreated organic waste into the oceans pollutes the water. Polluted ocean water can cause rashes, earaches, pink eye, respiratory infections, hepatitis, encephalitis, gastroenteritis and diarrhoea.

Pollution can Transform a Water Body into a Dead Zone

Decomposed organic matter and run-off water containing fertilizers, when mixed with a water body such as a lake, provides large amounts of nutrients to the aquatic plants and algae growing in the water body.

The nutrients stimulate excessive growth of aquatic plants and algae which block light from reaching the deeper regions of the water. This kills many types of aquatic organisms.When the

plants die, they decompose. The decomposing plants and aquatic organisms use up most of the oxygen present in the water. As a result, the water is left with very little dissolved oxygen. This results in the death of fish and other aquatic animals which depend on dissolved oxygen. Ultimately, the water body is left with very few life forms. Such areas are commonly called dead zones. Frequent acid rain can also turn lakes and ponds of a region into dead zones.

Chemical Contamination of Water

Water is an excellent solvent. Many kinds of chemicals easily dissolve in water. That is why when industrial waste is directly dumped into rivers,lakes or oceans, the water gets polluted with harmful chemicals.

Chemical Contaminated Water Pollutes Soil

Chemically contaminated water can pollute soil. It can kill soil organisms and reduce soil fertility. Soil can get chemically contaminated by the excessive use of chemical fertilizers and pesticides. Acid rain too damages soil, making it acidic. Plants do not grow well in acidic soil.

Unlike organic waste, many chemicals do not decompose and therefore remain in the water for a long time. Many of these chemicals are toxic and harm all kinds of life forms living in water bodies. Water can get polluted by pesticides during and sewage in towns and cities flow off into local streams and rivers during monsoon and ultimately reach the oceans.

In some regions, toxic chemicals that have contaminated soil or water have percolated deep into the soil along with water and have polluted the groundwater source. Pesticides have been found in well water in certain parts of India. Water from such wells cannot be used, as drinking water.

Pesticides from the soil can enter plants through water and contaminate food products including met, milk and fish. When fruits or vegetables from such plants are consumed, pesticides enter the human body. Similarly, when fish from chemically contaminated waters are consumed, the chemicals enter the human body. The human body cannot digest many of these chemicals in the human body, thereby harming our health.

Oil spills from oil tankers transporting crude oil often pollute the ocean causing much damage to marine life. A few years back, when an oil tanker collided with a reef, more than 11 million gallons of crude oil spilled into the sea around Alaska. The spill killed a large number of marine animals including birds. It also disrupted the life of fishermen living in the region.

Effects of Chemical Pollutants

Chemical contamination of drinking water can have a disastrous effect on human health. Pesticides, for example, can affect and damage the nervous system; cause liver damage and cancer. Mercury has similar ill-effects. It is also known to cause heart-related problems. In severe cases, mercury poisoning causes death by causing damage to the brain. Animals also suffer from mercury poisoning.

Purification of Water

Water can be purified using physical and chemical methods. Physical methods of purification include processes like boiling, filtration, sedimentation and distillation. Harmful organisms present in the water can be killed if water is boiled for about a minute. Micro-organisms die at a temperature above 70°C.

Filtration : This method is used to separate insoluble particles from water using a porous device. The device can be a fine piece of cloth or a device having fine pores that is used in water filters or a special paper used to filter liquids in a laboratory. The efficiency of a filtering device depends on the size of cores in it.

Sedimentation : This process allows the separation of undissolved particles from water. heavier substances that do not dissolve in water settle down at the bottom of the container.

Loading : At times, water contains extremely small insoluble particles. They remain suspended in water and take a long time to settle. Filtering such a mixture is a slow process because the tiny insoluble particles block the pores of a filtering device. The suspended particles can be separated by a process called loading.

A chemical like alum that binds itself to the suspended particles is added into the water. It settles the particles at the bottom.

Distillation : The distillation process is mainly used to obtain pure water for industrial purpose. It removes salt from water.

Water can be purified by using filtration, sedimentation, distillation and loading. These are physical processes of purifying water.

Chemical Purification of Water

Even water that appears clear and absolutely clean can contain harmful bacteria and dissolved substances. Water can be purified in several ways.

Water is treated with chemicals such as chlorine and iodine to mainly kill organisms present in the water. If water appears cloudy, strain it using a fine cotton cloth before treatment. After treating the water with chlorine or iodine, let it settle for about an hour. The effectiveness of the chemical treatment depends on the temperature of the water. it should be at least 20°C. If the water is very cold, place it in the sun to warm before treating it.

There has been a rise in nitrogen concentrations in drinking water supplies, mainly due to fertilizers and animal waste that contaminate water. Nitrates, when present in high concentrations (greater than 10 milligrams of nitrate per litre of water) are a serious health hazard to human being.

Acute nitrate contamination is linked to a condition that occurs primarily in infants called 'Blue Baby Syndrome'. The condition is rare. but it occurs when nitrate gets into the blood. Once the nitrate gets into the human blood, it readily binds to the haemoglobin molecules and prevents oxygen from binding to the red blood cells. This leads to severe oxygen deprivation, which can result in brain damage and death.

IMPACT OF WATER POLLUTION

1. Around the world most rivers and lakes are heavily polluted and their water is unfit for drinking. Water pollution is of major concern because 70 per cent of diseases are water-borne. According to an estimate, nearly two-thirds of all illness in India is due to pathogenic bacteria in water. Some of the water-borne diseases are typhoid, cholera, jaundice, diarrhoea and amoebiasis.
2. Most industrial wastes are toxic in nature. Their presence in water bodies makes water unfit for drinking and bathing. Fishes from these sources are also not safe to eat.
3. Oil spilled from oil tankers or during extraction of oil from deep-sea oil wells has a detrimental effects on ocean life, killing marine animals in many cases.
4. Sewage and organic wastes from the dairy industry, tanneries, paper mills, food-processing plants and runoff from agricultural lands are all rich in nutrients. They cause excessive growth of aquatic vegetation (algae and weeds) when they are discharged into water bodies. Sometimes the water body is entirely covered with algae. This excessive growth of weeds in nutrient-rich water bodies is called algal bloom or eutrophication. It harms aquatic life and often leads to loss of life in water bodies. Eutrophication mainly occurs in stagnant water bodies like ponds and lakes and not in flowing water.
5. The presence of pollutants in freshwater bodies changes the taste, colour and odour of water and makes it unfit for consumption.
6. Pesticides, weedicides and other toxic chemicals used for crop protection reach water bodies with runoff water. Pesticides like DDT and Aldrin have destroyed many useful organisms in soil and water. DDT is soluble in fat. It has entered the food and change its form and is harming humans and animals.

Control and Preventive Measures

Pollutants of water are so many and so varied in nature that their complete removal is not a simple task. However, the following measures can be taken to reduce them to safe levels.

1. Domestic sewage should not be discharged directly into water bodies without treatment. It has become a common practice all over the world to treat domestic water (sewage) chemically and biologically before releasing into rivers or seas. Sewage treatment plants remove various pollutants so that released water is reasonably clean.

2. It is gradually becoming mandatory for industrial units to install treatment plants for liquid wastes before releasing effluents into water bodies.
3. Scientists are engaged in developing beautifiers (plants and micro-organisms) for removal of toxic heavy metals, cyanides and other chemical pollutants of water. Industrial houses and governmental agencies should be ready to adopt new techniques and processes that are developed.
4. Farmers should be made aware of the ill-effects of overusing pesticides, chemical fertilizers and other toxic chemicals.
5. Offering of flowers, cloth and other ritual articles and the immersion of idols in rivers and other water bodies during festival should be avoided.
6. Awareness programmes should be undertaken to educate the masses on the importance of clean, uncontaminated water. People should also be educated to refrain from bathing, washing clothes, or disposing of dead bodies in freshwater bodies.
7. Laws related to the control of water pollution should be enforced strictly and loopholes in the law should be plugged by enacting more laws.

25% of the world's population is without safe drinking water

Let us see how water can be made safe for drinking :

You have already seen how water is filtered. This is a physical method of removing impurities. A popular household filter is a candle type filter.

Many households use boiling as a method for obtaining safe drinking water. Boiling kills the germs present in the water.

Chlorination is a commonly used chemical method for purifying water. It is done by adding chlorine tablets or bleaching powder to the water. We must be cautious. We should not use more chlorine tablets than specified. Ozone gas or iodine is also used for purification. In some water treatment systems ultraviolet rays are used.

Know the Keywords :

Air Pollution : Air which contains unwanted and harmful substances is known as polluted air.

Potable Water : Water that can be safely used for human consumption.

Global Warming: The earth receives heat from the sun. When the surface of the earth heats up, it radiates some of the heat towards the space.

Point to Remember

- Contamination of air with harmful gases, dust, smoke etc.
- Contamination of water with harmful toxic substances.
- Maintenance and upkeep of natural resources.
- Water which is fit for drinking.
- Process of adding chlorine in water to kill harmful germs.

EXERCISE TIME

A. Answer the following questions :

1. How have human actions polluted air ?
2. List any two air pollutants produced by burning fossil fuels.
3. What reacts with water in the atmosphere to form nitric acid ?
4. Name any two fossil fuels used by your family.
5. Name any two green house gases.
6. Which air pollutant produced by combustion of coal cause instant death ?
7. What are the effects of chemical pollutants ?
8. Name a chemical that can be used to purify water.
9. List the physical methods of purifying water. Describe any one method.
10. When does a pond become a dead zone ?

B. Give reasons :

1. A thermal power plant can transform a beautiful lake into a dead zone.
2. Incomplete combustion of fossil fuels pollutes air.
3. Excessive use of fossil fuels can increase the earth's average temperature.
4. Boiling makes water safer to drink.
5. Water is easily polluted.

C. Tick (✓) the correct option :

1. Burning coal produces plenty of :
   (i) water vapour ◯ (ii) sulphur dioxide ◯ (iii) methane ◯
2. Increase in carbon dioxide and methane in the atmosphere can lead to :
   (i) ozone depeletion ◯ (ii) global warming ◯ (iii) acid rain ◯
3. The Bhopal gas tragedy occurs because of leakage of :
   (i) carbon dioxide ◯ (ii) meythyl isocynate ◯ (iii) chlorofluoro carbons ◯
4. Ozone reacts with :
   (i) carbon dioxide ◯ (ii) meythyl isocynate ◯ (iii)chlorofluoro carbons ◯
5. Increase the CFCs in the atmosphere can lead to :
   (i) ozone depeletion ◯ (ii) global warming ◯ (iii) acid rain ◯

Creative Work

- **Prepare colourful posters to highlight the steps you can take to prevent air pollution.**

Model Test Paper-1

Based on Chapters 1 to 9

A. Answer the following questions :

1. What is threshing ? How it is done ?
2. How does a farmer prepare the soil before sowing the seeds ?
3. What is food poisoning ?
4. What are 4R principles ?
5. How is rust formed ?
6. Write the origin and uses of coal.
7. What are charcoal and biogas ?
8. How are fire can be controlled ?
9. What is biodivesity ? Explain with an example.
10. What is cell theory?
11. Are all cells similar? Explain.
12. What are oviparous animals?

B. Fill in the blanks :

1 All egg laying animals are callled _____ animals.
2. Animal cells do not have _____.
3. A cell is the smallest _____ of life.
4. Animals and plants are _____ resources.
5. Natural gas and biogas are _____.
6. Wheat is an example of _____ crops.
7. Polio is caused by _____.
8. Rayon is also known as _____.

C. Match the following :

Column 'A'	Column 'B'
1. Yeast	(i) fixing nitrogen
2. Bacteria	(ii) setting of curd
3. Rhizobium	(iii) baking of bread
4. Virus	(iv) causes cholera
5. Lactobacillees	(v) causes Aids

D. Write 'T' for true and 'F' for false statement :

1. Teflon coating is non-sticky. ◯
2. Rusting is aform of corrosion. ◯
3. Coal and methane are fossil fuels. ◯
4. Fuel is a natural resource. ◯
5. All animals lay eggs. ◯
6. Crackers have explosive substances. ◯

E. Complete the equations :

1 Iron + Moisture + oxygen ⟶ _____
2. Non Metal + oxygen ⟶ _____
3. Sodium + oxygen ⟶ _____

F. Tick (✓) the correct option :

1. Which of the following is used to scare away birds in the field ?
   (i) tree ◯ (ii) rifle ◯ (iii) scarecrow ◯
2. Which of the following is a natural fibre ?
   (i) PVC ◯ (ii) polythene ◯ (iii) wool ◯
3. Brass is an alloy of copper and :
   (i) zinc ◯ (ii) aluminium ◯ (iii) iron ◯
4. When coal is burnt in air we get :
   (i) Oxygen ◯ (ii) carbon–dioxide ◯ (iii) hydrogen ◯
5. Nerve cells are known as :
   (i) blood cells ◯ (ii) neurons ◯ (iii) lymph ◯

Model Test Paper-2

Based on Chapters 10 to 18

A. Answer the following questions :

1. What is an Adam's apple? Why do male develop Adam's apple in their throat?
2. What is pressure?
3. Give some examples where friction is useful or necessary?
4. How the static friction is measured?
5. What creates sound pollution ?
6. What is an echo?
7. Write an essay on earthquake.
8. What is Braille system ?
9. Write the laws of reflection.
10. Write a short paragraph on sun.
11. List the physical methods of purifying water.
12. When does a pond become a dead zone?

B. Fill in the blanks :

1. _____ is the transitional stage of human development.
2. Sometimes friction is _____.
3. The S.I. unit of frequency is _____.
4. Pure water _____ conduct electricity.
5. The _____ of metal can be seen on electrode.
6. Charges are of two types (i) _____ (ii) _____.
7. Friction is important for many of our _____.

C. Give reasons :

1. Water is easily polluted.
2. Incomplete combustion of fossil fuels pollutes air.
3. Boiling makes water safer to drink.

D. Write 'T' for true and 'f' for false statement :

1. A comet revolves around the planet. ( )
2. Charges are of three types. ( )

3. Earthquake means trembling of the earth. ◯

4. Light is reflected from all sides. ◯

5. A Sun is the closest star to the earth. ◯

6. The falling ray of light is called relflected ray. ◯

E. Tick (✓) the correct option :

1. Ozone reacts with ?

   (i) carbon dioxide ◯ (ii) methyl isocynate ◯

   (iii) chloro fluoro carbons ◯

2. A galaxy is made up of :

   (i) everything that exists on earth and in space ◯

   (ii) meany millions of stars only ◯

   (iii) all the planets ◯

3. By applying lubricant, friction is :

   (i) reduced ◯ (ii) increased ◯ (iii) none of these ◯

4. Unpleasant sound is called :

   (i) pitch ◯ (ii) echo ◯ (iii) frequency ◯

5. Pure water is a :

   (i) good conductor ◯ (ii) poor conductor ◯ (iii) semi conductor ◯