CHAPTER-14 : WATER

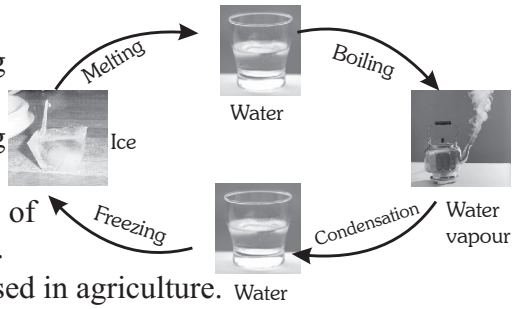
A. Answer the following questions :

1. The three states of water are : solid (ice), liquid (water), and gas (water vapour).

   All the three states of water are interchangeable further heating it turns into its vapour. On cooling, water vapour change into liquid water. On further cooling liquid water changes into ice.

   Thus it is clear that all the three states of water are interchangeable.

2. **Use of Water**

   (i) Water helps in maintaining the temperature of our body.

   (ii) Water helps in removing wastes from the body.

   (iii) Plants also use some amount of water during photosynthesis.

   (iv) A large amount of water is used in agriculture.

   (v) Most of the industrial processes that involve the conversion of raw material into finished products require water.

   (vi) Water acts as a cooling fluied in the generation of power from fossil and nuclear fuels.

   (vii) Water is also used in purposes such as firefighting, street cleaning, sanitation and sewage disposal.

3. Water is essential for all living beings. No living being can survive without water. Water is the main component of body cells of all living beings. It is an important medium for the transportation of food, oxygen and carbon dioxide in the bodies of living beings. Water is necessary for the removal of wastes from the bodies of living beings. It is necessary for the growth of all living beings. Besides, it is essential for germination as well as for photosynthesis in plants on which all other living beings depend directly or indirectly, for food. Thus, it is clear that water is essential for sustenance of life.

4. A drought occurs when an unusual scaricity of rain causes a serious hydrological imbalance. In such a situation water supply reservoirs get empty, wells dry up and crops get damaged.

5. **Effects of Floods**

   Floods not only damage property and endanger the lives of humans and animals, but have other effects as well. Rapid run-off causes soil erosion as well as sediment deposition problems in downstreams. Spawning grounds for fish and other wildlife habitats are often destroyed. High-velocity currents increase flood damage; prolonged high floods delay traffic and interfere with drainage and agricultural use of lands. Bridge abutments, bank lines and other structures within floodways are damaged, and navigation and hydroelectric power are often impaired, financial loss also occurs due to floods.

6. **Rainwater Harvesting**

Rainwater harvesting is a method of collecting rainwater when rain falls and storing it to use during the non-rainy season.

The rainwater that falls on the earth's surface/roofs of houses is directed to bore-wells or pits or wells through pipes. This can be used later when required. This kind of preserving water is an ideal solution for areas having inadequte water resources. Rainwater can be to the extent of 55,000 litres per 100 sq metres in year from roof tops.

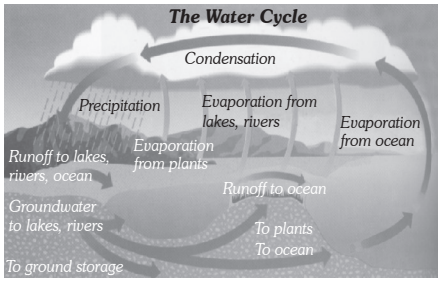
7. A cloud is a collection of water droplets or pieces of ice floating in the atmosphere. The process of formation of a cloud is discussed below.

As the height above the earth increases, temperature drops. Thus, the air theat moves up gets cooler and cooler. When that air reaches at sufficient heights, it becomes so cool that water vapour present in it condenses to form tiny drops of water called droplets.

These tiny droplets remain suspended in the air and move along with air. When these tiny droplets come close, they combine to form bigger droplets and their size goes on increasing. But once the size of these droplet becomes sufficiently larger, they can be seen as clouds.

This is how clouds are formed.

8. **Water Cycle**



Water constantly moves from the earth to the air and back again. The constant circulation of water is known as the water cycle.

The water in seas, rivers, lakes, ponds or streams evaporates because of the heat of the sun. Plants also give out large amount of water from their leaves. The water vapour rises up. The air higher up in the atmosphere is cooler. This cools the water vapour and it condenses to form tiny drops of water on small dust particles. These drops of water together form clouds. As the clouds get cooled further, the water drops become bigger. When they become too heavy, they fall to the earth as rain.

The rainwater enters the seas, rivers, lakes, ponds and streams and then evaporates again. Thus, the water cycle in nature goes on.

9. **Activity to show that the evaporation and condensation take place at the same time.**

Take a clean and dry jar with a lid. Remove its lid and place small piece of wet cotton in it. Replace the lid tightly. Place the glass jar in the sunshine for half an hour.

You will notice that tiny droplets of water are sticking to the upper inner surface of glass jar. It is because the water in the cotton changes into vapour on absorbing the heat energy of the sun. This process of slow change of water into water vapour on absorbing heat energy is called evaporation.

The water vapour on coming into contact with upper cold surface of glass jar condenses to form tiny droplets of water.

Thus, it is clear that in such a condition as discussed above, evaporation and condensation take place at the same time.

B. Fill in the blanks :

1. fresh water 2. cloud 3. evaporates 4. solid (ice), liquid (water), and gas (water vpour) 5. physical change 6. melting point 7. oxygenated

C. Write 'true' or 'false' :

1. True 2. False 3. True 4. False 5. True 6. False

D. Define the following :

1. **Fresh water :** Water which is fit for human consumption is known as fresh water.
2. **Evaporation :** The process of conversion of water into water vapour on absorbing heat is called evaporation.
3. **Condensation :** The process by which water vapour change into liquid water on cooling is called condensation.
4. **Clouds :** A cloud is a collection of water droplets or pieces of ice floating in the atmosphere.
5. **Water cycle :** Water constantly moves from the earth to the air and back again. The constant circulation of water is known as the water cycle.
6. **Rainwater harvesting :** Rainwater harvesting is a method of collecting rainwater when rain falls and storing it to use during the non-rainy season.
7. **Drought :** Drought is a condition of abnormally dry weather within a geographic region where some rain might usually be expected.
8. **Flood :** Sometimes there occur very heavy rainfall in some particular regions that rainwater fills the rivers, lakes, wells and ponds to the brim. Water from flooded waterbodies spreads the nearby land. Such a condition is referred to as a flood.
9. **Water conservation :** Saving water wherever possible is known as water conservation.

E. Differentiate between :

1. **Evaporation :** The process of conversion of water into water vapour on absorbing heat is called evaporation.

   Condesnsation : The process by which water vapour change into liquid water on cooling is called condensation.
2. **Drought :** Drought is a condition of abnormally dry weather within a geographic region where some rain might usually be expected.

   Flood : Sometimes there occur very heavy rainfall in some particular regions that rainwater fills the rivers, lakes, wells and ponds to the brain. Water from flooded waterbodies spreads the nearby land. Such a condition is referred to as a flood.
3. **Fresh Water :** Water which is fit for human consumption is known as fresh water.

   Salty Water : Water which contains high levels of salts dissolved in it and hence is unfit for human consumption is called salty water.

4. **Freezing Point :** The temperature at which a liquid becomes solid, i.e. freezes, is called its freezing point.

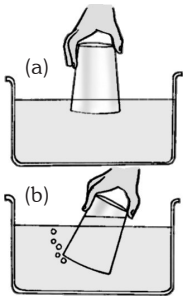
   Boiling Point : The temperature at which a liquid starts boiling is called its boiling point.

CHAPTER-15 : AIR

A. Answer the following questions :

1. We can feel air in many ways :
   (a) During storms, the wind blows at a very high speed and it may uproot trees and blow off the roof tops.
   (b) When the fan is switched on, the pages of an open book begin fluttering.
   (c) When the leaves of the tree rustle or the clothes hanging on a clothesline sway, we say air is moving.
2. The envelope of air which surrounds the earth is called the atmosphere.
3. **Composition of Air**

   Air is a mixture of gases. It consists of about 78% nitrogen, 21% oxygen, 0.9% inert gases, 0.04% carbon dioxide and traces of water vapour, dust particles and other gases.
4. **Activity to show that air occupies space**

   Take a tub and fill it with water. Now take a glass and turn it upside down and try to push it in the tub as shown in figure (a) Then tilt the glass to one side as shown in figure (b) and observe what when the glass is pushed upside down, it is difficult to push it in the tub and no water enters the glass while the water enters the glass in tilted position. It happens so because the glass that seemed 'empty' actually not empty, it is filled with air. When the glass is tilted, air escapes as bubbles and leaves the space for water to enter. This shows that air occupies space.
5. We need oxygen for breathing. It is also required for burning of fuel and other things.
6. Most of the animals living in water, like fish, crales, oysters, prawns, etc; have gills to breathe. They take in oxygen dissolved in water. Some aquatic animals like whales and dolphins have lungs. They do not take in oxygen dissolved in water. They come to the surface of water to breathe in atmospheric oxygen.

   Aquatic plants utilise air through the stomata. They also exhange oxygen and carbon-dioxde through the roots. Almost all parts of aquatic plants are capable of breathing.
7. We need air for the following purposes :
   (a) Air aids burning. Oxygen, one of the gases present in air helps to burn things.
   (b) Air is needed for breating. Almost all living things need air to breathe.
   (c) We depend on plants for food but plants depend on carbon dioxide, sunlight, to make their own food, this carbon dioxide they get from the air.

(d) Birds fly in air. It helps them to fly higher into the sky.
(e) It fills up empty spaces in things to make them more useful. For example, in tubes, balloons, tyres, pillows, etc.
(f) It is used for drying agricultural products like grains, pulses, fruits, etc. This process becomes faster in moving air.
(g) The moving air called wind rotates the windmill. The windmill is used to grind flour and to generate electricity.
(h) Clothes become dry due to evaporation done through hot air.
(i) Air also helps in pollination of flowers and in dispersal of seeds.

8. The process by which air is rendered unclean is called pollution.

Steps to control air pollution

(a) We should plant more and more trees. They help in reducing air pollution as they use carbon dioxide present in air and give out oxygen.
(b) Cars, scooters and other vehicles must be checked regularly to make sure that they are not polluting the air.
(c) Factories should not be set up in cities.

B. Fill in the blanks :

1. atmosphere 2. space 3. gases 4. oxygen 5. nitrogen
6. 21% 7. carbon dioxide, oxygen

C. 1. c 2. c 3. b 4. b 5. a

D. 1. F 2. T 3. F 4. F 5. T 6. T 7. T 8. F

CHAPTER-16 : WASTE

A. Answer the following questions :

1. All those materials that are no longer needed and are discarded constitute waste. Sources of the waste are :
   - Houses
   - Industries
   - Agricultural fields
   - Nuclear power plants
   - Hospitals
2. Some of the common industrial waste are :

   Fly ash : Most of the thermal power plants use coal as a fuel. The burning of coal produces fly ash which is discharged from the chimneys.

   Smoke : Industries produce huge quantities of harmul smoke which consists of polluting gases such as sulphur dioxide, oxide of nitrogen, carbon dioxide, carbon monoxide and other pollutants which pollute the environment.

   Chemicals : Industries also let out various chemicals and acids into rivers and lakes which are responsible for polluting waterbodies.

   Miscellaneous Waste : Industries also create wastes in the form of oil discharges, synthetic materials, electronic wastes, radioactive waste, glass, metal, plastic objects, etc.
3. Special wastes include hazardous wastes from different sources, e.g.,
   (a) Radioactive waste from nuclear power plants, laboratories, hospitals, etc.
   (b) Toxic substances such as heavy metal sludges, pesticides, pharmaceuticals, etc.

(c) Biological products such as enzymes, antibiotics, pathogenic and pathological wastes, etc.

(d) Miscellaneous products such as inflammable substances, corrosive materials, explosives, etc.

4. The 3R's strategy is the most effective way by which we can manage waste. The 3R's strategy includes the following steps :

   Reduce : The most important way to deal with solid waste problem is to reduce the amount of waste produced in the first place. Ways the reduce wastes include buying recycled products, using washable rather than disposable utensils, drapers, carry bags, etc. Besides, products purchased can be transported in reusable cloth bags instead of disposable plastic or paper bags.

   Reuse : Reuse of materials also helps in managing waste. Items should be made durable enough to withstand repeated use. We must try to reuse the maximum possible extent all those items that can be used again.

   Recycle : Recycling means processing of industrial and household waste so that it can be reused. Some materials like glass, plastic paper and metal can be reycled. So the water products made from recyclable material are collected and recycled in factories, which not only reduces waste but also make the new objects available at cheaper prices.

5. Ways to reduce waste include buying recycled products, avoiding buying products that cannot be recycled, using washable rather than disposable things, and reusing products, such as plastic bags. Besides, buying products such as food or paper products in bulk cuts down the packaging materials and hence reduces waste. Waste can also be reduced if usable products are transported in reusable cloth bags instead of disposable plastic or paper bags.

6. Recycling means processing of industrial and household waste so that it can be reused. Recycling has the following benefits :

   (i) It slows down the depletion of many valuable resources.

   (ii) It reduces the volume of waste upto 50%.

   (iii) It reduces the level of pollutants released into the air.

   (iv) It lessons the demand of raw materials and energy.

   (v) It helps in saving many hectares of valuable land which otherwise may be required for the burial of waste metals.

7. Contamination of air with pollutants (unwanted materials) like harmful gases, unburnt, fuel particles, etc. is known as air pollution.

   Air pollution affects humans badly as it causes various respiratory disorders, lung diseases, eye-irritation, etc in them.

   Air pollution causes adverse effects on the environment also. It leads to change in climate and amount of rainfall, acid rain and rise in sea level.

8. Loud and unpleasant sounds produced by horns of vehicles, machines of factories, generators, etc. create the pollution called noise pollution. Regular exposure to land and harsh sounds leads to deafness in humans. It also has been observed that people who have to spend some hours in loud noises daily, develop acrimony. Besides, birds and animals to get

disturbed due to noise pollution.

B. Define the following :

1. **Sewage :** Water and waste from drains and toilets is called sewage.
2. **Agricultural wastes :** The wastes that result from farms, feed lots and livestock yards are called agricultural wastes. These wastes include paddy husk, baggasse from sugarcane, tobacco and corn residues, slaughter house wastes, manures, etc.
3. **Biodegradable wastes :** Those wastes that can be broken down through the action of micro-organisms into their simpler constituents are called biodegradable wastes.
4. **Non-biodegrable wastes :** The wastes that cannot be disintegrated by action of micro-organisms and remain unaffected from decomposition are called non-biodegradable wastes.
5. **Composting :** Composting is one of the oldest method of waste disposal. It involves the breakdown of biodegradable kitchen and farm waste by natural process and the products obtained called compost is used as manure.
6. Pollution : Mixing of pollutants in air, water and soil is called pollution.

C. Fill in the blanks :

1. garbage 2. recycling 3. deafness 4. diseases 5. recycled glass

D. Match the columns :

1. (iv) 2. (v) 3. (ii) 4. (i) 5. (iii)

E. 1. **Domestic Waste :** Household waste is called domestic waste which includes garbage, rubbish, excreta, ashes and sullage.

Industrial Waste : The waste produced by industries is called industrial waste which includes fly ash, smoke, chemicals, etc.

2. **Biodegradable Waste :** Those waste that can be broken down though the action of micro-organisms into their simpler constituents are called biodegradable wastes.

Non-biodegrable Wastes : The wastes that cannot be disintegrated by action of micro-organisms and remain unaffected from decomposition are called non-biodegradable wastes.

3. **Recycling :** Recycling is the processing of industrial and household waste so that it can be reused.

Reusing : Repeated use of any articles instead of disposing it after using only once is called reusing.

4. **Water Pollution :** Contamination of water due to mixing of industrial waste, sullage or any other pollutant is called water pollution.

Land Pollution : Contamination of soil due to mixing of chemicals, waste from households, plastic, rubber, etc. is called land pollution.

5. **Air Pollution :** Contamination of air with pollutants like harmful gases, unburnt fuel particles, etc. is known as air pollution.

Noise Pollution : Loud and unpleasant sounds produced by horns of vehicles, machines of factories, generators, etc. create the pollution called noise pollution.