

Water

1. What are the main sources of Water on Earth Surface?

The main sources of water on Earth Surfaces are

- a. Snow, Frost
- b. Rain Water
- c. River Water
- d. Lake Water and
- e. Sea Water

2. What are the main sources of water below the earth surface?

Ans. The main sources of water below earth surface are

- a. Well Water
- b. Spring Water

3. What is the importance of water?

Ans. The importance of the water is as below

a. Basic Uses-

- Life Processes- Water is used by all plants, animals and human for carrying out various metabolic processes including photosynthesis by plants and excretion by animals and human.
- Household- Water finds numerous applications such as watering plants, washing clothes, cooking, bathing etc.
- Firefighting- Water is used for extinguishing fire either directly or as a constituent in a fire extinguisher.
- Transportation- Water serves as a means for transporting goods, via ships.

b. Habitat-

Water serves as a habitat for marine life, i.e. preferred place for an organism to live.

c. Industrial uses-

Water generates electricity in hydroelectric power stations. It generates steam in boilers, used for various industrial purposes. Water finds application in chemical and other industries for cooking and cleaning operations.

d. Agricultural uses-

Water finds importance in irrigation, production of crops and as a medium for spraying pesticides.

4. What are the three states of Water?

Ans. The three main states of water are

Solid: As snow and Frost

Liquid: Sea Water, River water, Lake Water

Gaseous States: As water vapor in air, the amount depending on chemical conditions.

5. What is Water Cycle?

Ans. Water Cycle is a natural process by which the circulation of water takes place from the earth's surface to the atmosphere and back to the earth's surface as rain water.

6. Describe the process of Water Cycle?

Ans. The water cycle, also known as the hydrologic cycle, is the continuous movement of water from the earth's surface to the atmosphere and then back to the ground. It is a continuous process. Hence, it does not have a starting or an ending point. Thus, the water present on earth has been in circulation since the evolution of the earth. Water goes through all the three states, solid-liquid-gas, in the process. There are several factors that assist the water cycle, the sun, air currents to name a few.

The stages involved in a complete water cycle are:

- **Stage I: Evaporation and Transpiration** The sun's energy heats up the lakes, rivers, oceans, swamps and other water bodies which subsequently increase the temperature of the water present in them. Consequently, some water evaporates as vapour into the air. The rising air currents take the vapour up in the sky. Simultaneously, plants and trees also lose water to the atmosphere in the form of vapour which rises up in the sky.
- **Stage II: Condensation** As the vapours rise high, the cooler temperatures make them cool down and turn back into liquid – condensation. Wind and air currents move the moisture around, leading to the formation of clouds.
- **Stage III: Precipitation** Wind movements cause the clouds particles to collide. As they become water laden, they develop into rain bearing clouds and fall back onto the earth's surface by the process known as precipitation. This may occur in the form of rain, hail, snow or sleet depending upon the temperature conditions.
- **Stage IV: Runoff and Infiltration** The precipitation either runs off into oceans, rivers and ground surface or is absorbed into the soil (infiltration).

7. Why water is called universal solvent?

Ans. Pollution of water is the process of contamination of water by various pollutants which include bacteria, viruses, domestic sewage and industrial chemicals etc.

8. What is Solute?

Ans. The substance which dissolves or disappears in the solvent i.e. liquid to form a solution is called a solute.

9. What is Solvent?

Ans. The liquid or medium of dissolution which allows the solute to dissolve in it, so as to form a solution is called solvent.

10. What is Solution?

Ans. A homogeneous mixture of a solute in a solvent is called a Solution.

11. What is Solubility of Solute?

Ans. Solubility of Solute is the maximum of solute in grams that will saturate 100g. of water at t°C.

12. On which factors the solubility of solute depends?

Ans. Solubility of most solids increases with increase in temperature of water.
Solubility of gases decreases with increase in temperature of water.

13. What is Potable Water?

Ans. Water which fit for human consumption and for drinking purpose is called Potable Water.

14. What are the characteristics of Potable Water?

Ans. The characteristics of Potable Water are

- a. It should be clear and colorless.
- b. It should not contain any harmful germs or bacteria.
- c. It should be free from salts which endanger human life such as nitrates, cyanides.
- d. It should have a good taste. Taste in water is due to small number of dissolved gases and minerals in water.

15. What is Distilled water?

Ans. It is completely free from dissolved salts and hence when contaminated will tend to dissolve essential salts from the human body and hence cause its deficiency.

16. What is Sea Water?

Ans. It is the most impure form of water and contains a high percentage of dissolved salts mainly sodium chloride. In addition, it also contains salts of calcium and magnesium. Hence it is unsuitable for drinking and household purposes.

17. What are essential to make Potable Water?

Ans. To prepare Potable Water we must purify surface water.

Purification of water must be carried out to remove-

- Dissolved minerals e.g. calcium and magnesium salts.
- Dissolved gases e.g carbon dioxide
- Dissolved suspended impurities e.g. sand, organic matters etc.
- Dissolved causing germs which may cause diarrhea, typhoid etc.

18. What are the uses of Water Purification Plants?

Ans. In cities water is reserved from rivers and lakes and may not be potable. Hence water is purified in a purification plant before it enters individual homes through water taps.

19. To remove suspended impurities which process are used?

Ans. To remove suspended impurities we use

- a. Sedimentation and Decantation
- b. Filtration Process.

20. What is Sedimentation and Decantation?

Ans. This process is used to remove suspended impurities from water.

Used Chemicals: Alum and Lime

Process: Alum and Lime are added to the water in the sedimentation tank. They coagulate the suspended impurities, which soon settle down.

21. What is Filtration?

Ans. This process is used to remove suspended impurities from water.

Used Chemicals: Sand and Gravel

Process: The water after sedimentation is passed through beds of sand and gravel. The sand and gravel layers remove the suspended impurities, microorganisms and pure water remains behind in the filtration tank.

22. To remove harmful germs from water which process are used?

Ans. To remove harmful germs we use

- c. Chlorination
- d. Boiling Process.

23. What is Chlorination?

Ans. This process is used to remove harmful germs from water.

Used Chemicals: Chlorin, Bleaching powder

Process involved: Liquid Chlorine is added in the chlorination tank to kill the germs in the filtrated water. The water then passes into overhead tanks and later enters home.

24. What is Distillation?

Ans. This is a process through which impure water changes to steam which condenses back to give pure water.

It is a Laboratory method.

25. What is Water Pollution?

Ans. Water pollution can be defined as the contamination of water bodies. Water pollution is caused when water bodies such as rivers, lakes, oceans, groundwater, and aquifers get contaminated with industrial and agricultural effluents.

26. What is chemical Pollution?

Ans. A large number of industrial chemicals which include chemicals from plants, textile and dyestuff industry and various acids and salt solution enter into water when discharged as industrial wastes.

Chemical pollutants include magnetic salt solutions of mercury and lead which cause heavy devastation of marine and plant life.

Agricultural wastes include poisonous pesticides mainly fungicides and insecticides which may also enter underground water through the soil.

27. What is Thermal Pollution?

Ans. Such industries such as Iron and Steel industry and chemical plants use large amounts of water for varied functions. This discharged water after going through technical process is rendered hot and on entering streams of natural water enhance growth of harmful biological organisms. This leads to death of organisms.

28. Which types of diseases occurred due to water pollution?

Ans. Human and animal excreta when washed by rain water contaminate water increasing the number of bacteria, harmful micro-organisms in water.

This polluted water causes water-borne diseases such as hypoids, cholera, dysentery and gastroenteritis etc.

29. How can we avoid water pollutions?

Ans. By following the following steps we can avoid Water Pollution.

- e. Human wastes such as oil and chemical should not enter into the water.
- f. Proper toilets and sewage system should be used to prevent human excreta, containing disease causing organisms to enter into water.
- g. Washing of clothes and bathing should be avoided near the water sources.
- h. Planting of trees near water sources including river banks also minimize pollution.
- i. To minimize thermal pollution the water should be cooled before being discharged as a pollution.
- j. Man should be made aware through various awareness program and media about the harmful effects of water pollution and ways to control it.

30. What is conservation of water?

Ans. Conservation of water means, preventing wastage of water so that clean water can be obtained by preventing pollution of water and by protecting the sources of water.

31. Why Conservation of Water is essential?

Ans. In spite of large quantity of water on earth's surface only small percentage is potable water which is fit for human consumption and household purposes. The need for water is ever increasing and hence all sources of water need to be conserved.

32. How can we conserve water?

Ans. The process of conservation of water are

- k. Recycled water may be used in industries and in agriculture.
- l. Rain water harvesting which is a means of utilizing rain water instead of allowing it to be wasted to be conducted by building takes or pits in low lying areas and collecting roof top rain water through pipes into tanks.
- m. Dams may be constructed for adequate collection of water.
- n. Drip irrigation in agriculture utilizes supply of water in small quantities.
- o. Pollution of river water must be checked by cleaning rivers on a nation-wide basis.
- p. Wells should be covered and washing and cleaning should be prevented near a well.
- q. Water saving devices must be used in homes such as closing running taps and using smaller cisterns in toilets. Checking all leakages in household pipes, turning off the water tap while brushing teeth and while washing hands, using less electricity, since power plants also consume substantial amount of water.