8th Science Lesson 18 Questions in English

18] Water

1. Assertion (A): Two-third of the planet Earth is filled with water.
Reasoning (R): Water exists in solid and liquid states only.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Three fourths of our planet earth is filled with water. Water exists in three states namely solid, liquid and gas.

2. Which is the major water source in the surface of earth?
a) Glaciers
b) Ground water
c) Rain
d) Sea
Explanation
Water on the surface of the earth is found mainly in oceans (97.25%), polar ice caps and glaciers (2.05%) and the remaining is in lakes, rivers and aquifers - ground water.

3. Choose the Incorrect statements.
i) The Chemical name of water is di hydrogen monoxide.
ii) Water can be broken into hydrogen and oxygen molecules.
iii) Water is chemically an unstable compound.
a) i only
b) ii only
c) iii only
d) None of the above
Explanation
Even our body is made up of 65% of water but it is not apparent. Water is a chemically stable compound. Its chemical name is di hydrogen monoxide (H_2O). It can be broken up into hydrogen (H_2) and oxygen (O_2) when an electrical current is passed through it.

4. What is the name of the process using electric current to break down the water molecules?
a) Electrolysis
b) Distillation
c) Sterilization

d) Chlorination

Explanation

The process of breaking down of water molecules by the passage of electric current is known as electrolysis of water.

5. Which of these electrodes are used in the electrolysis process of water?

a) Lead

b) Iron

c) Carbon

d) Copper

Explanation

Electrolysis of water can be easily demonstrated with the help of an experiment. In this experimental set up, a glass beaker is fixed with two carbon electrodes and it is filled with water up to one third of its volume. The positive carbon electrode acts as anode and the negative carbon electrode acts as cathode.

6. Which of these is collected in the cathode of the electrolysis experiment?

a) Minerals

b) Oxygen gas

c) Hydrogen gas

d) None of the above

Explanation

The electrodes are connected to a battery and current is passed until the test tubes are filled with a particular gas. If the gas collected is tested using a burning splint we can notice that the gas in cathode side burns with a popping sound when the burning splint is brought near the mouth of the test tube. This property is usually shown by hydrogen gas and so it is confirmed that the gas inside the test tube is hydrogen.

7. Which of these gas burns brightly?

a) Oxygen

b) Hydrogen

c) Nitrogen

d) Helium

Explanation

The burning splint placed near the anode side burns more brightly confirming that it is oxygen gas.

8. Assertion (A): The Hydrogen and oxygen ratio of water is 1:2.

Reasoning (R): Every two volumes of hydrogen there is one volume of oxygen in water.

a) Both A and R is True and R is the correct explanation of A.

b) Both A and R is True but R is not the correct explanation of A.

c) A is False but R is True.
d) Both A and R is False.
Explanation
The ratio of hydrogen and oxygen is 2:1. Hence, for every two volumes of hydrogen collected at the cathode, there is one volume of oxygen collected at the anode.

9. Name the scientist who chemically prepared the water?
a) Henry Cavendish
b) Antoine Lavoisier
c) John Dalton
d) Marie Curie
Explanation
Water was first prepared in 1781 by an English scientist Henry Cavendish. He discovered hydrogen gas when active metals reacted with Sulphuric acid. The hydrogen gas released was highly inflammable and burnt to form a colorless product called water.

10. Which of this process also produces water chemically?
a) Reduction of metal oxide by hydrogen.
b) Respiration of animals and plants.
c) Burning Hydrogen and hydrocarbons in air.
d) All the above
Explanation
Water is also produced by the reduction of metal oxide by hydrogen, burning of hydrogen in air and burning of hydrocarbons in air. Respiration of plants and animals also releases water.

11. Choose the correct statements about the Henry Cavendish.
i) Discovered hydrogen and called it as inflammable air.
ii) Metals and strong acids were mixed to create hydrogen.
iii) Metals and strong bases were mixed to create carbon dioxide.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Henry Cavendish was a British philosopher, scientist, chemist, and physicist. Cavendish is noted for his discovery of hydrogen. He called it inflammable air. He mixed metals with strong acids and created hydrogen. He created carbon dioxide also by combining metals with strong bases.

12. Which of these statements are not true regarding the laboratory preparation of water?
a) Pure hydrogen is passed through anhydrous calcium chloride to absorb water vapor.

b) Dry hydrogen is burnt with sufficient air supply to produce water droplets.
c) The water droplets are collected in a hot flask for sterilization.
d) Distilled water is obtained by the laboratory method.
Explanation
The apparatus used for the preparation of water in the laboratories. In this method, pure hydrogen gas is passed through anhydrous calcium chloride to absorb water vapor, if present. Dry hydrogen coming out of the opening is burnt with sufficient supply of air. The burnt hydrogen gas forms droplets of water, when it comes in contact with the cold flask. Distilled water without any dissolved matter is obtained by this method.

13. Which is not a property of nature pure water?
a) Colorless
b) Odorless
c) Tasty
d) Transparent liquid
Explanation
Nature Pure water is a clear and transparent liquid. It is colorless, odorless and tasteless.

14. Assertion (A): The boiling point of water is 100°C at atmospheric pressure.
Reasoning (R): The water boils and changes to steam in the boiling point.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
The boiling point of water is 100°C at atmospheric pressure. At this temperature, water boils and changes to steam.

15. Which of these increases the boiling point of the water?
a) Decrease in pressure
b) Decrease in temperature
c) Increase in pressure
d) None of the above
Explanation
The boiling point of water increases with increase in pressure. For example, when a pressure cooker is heated, a high pressure is built inside it. The high pressure increases the boiling point of water. Thus water remains a liquid at a higher temperature (> 100°C) in the cooker. This cooks the food faster.

16. Which of these is not a physical property of pure water?

a) Density is 100 gm/cm3.
b) Boils at 100°C at one atmospheric pressure.
c) Pressure changes do not affect the boiling point.
d) Freezes exactly at 0°C at one atmospheric pressure.
Explanation
Pure water has the following physical properties.

- Pure water boils at 100° C at one atmospheric pressure.
- Pure water freezes at exactly 0°C at one atmospheric pressure.
- Pure water has a density of 1 gm/cm^3

17. Choose the correct statements about the freezing point of water.
i) The freezing point of water is 0°C.
ii) The freezing point of water increases with increase in pressure.
a) i only
b) ii only
c) Both i and ii
d) Neither i nor ii
Explanation
Water freezes at 0°C and forms ice. Thus, the freezing point of water is 0°C. The freezing point of water decreases with increase in pressure.

18. Which of the following statement is not true?
a) The Pressure exerted by the skaters on ice lowers the freezing point.
b) The Melting ice underneath the skater allows gliding with little effort.
c) The Skaters exert high pressure which re-freezes the ice continuously.
d) The Pressure is decreased when the skaters move forward and water re-freezes to ice.
Explanation
When the skaters move on ice, they exert pressure on it. This pressure lowers the freezing point. As a result, the ice melts underneath the skate and allows the skaters to glide across the ice with little effort. When the skaters move forward pressure is decreased and the water re-freezes to ice again.

19. Which of this statement is true regarding the frozen ice cubes and water?
a) At room temperature ice cubes melts on the surface of water.
b) Ice cubes are heavier than the normal water.
c) Frozen ice cubes are lighter than water and it floats on the water surface.
d) Density of ice cube is higher than the water.
Explanation

When ice cubes are put in a glass of water at room temperature, they float on the surface of the water. This is because ice is lighter than water. It means that the density of ice is lower than that of water.

20. Choose the Incorrect statements.
i) Ice is a good conductor of heat.
ii) In 0°C water below the frozen ice remains in liquid form.
iii) The water below the frozen ice is used for the survival of the aquatic life.
a) i only
b) ii only
c) iii only
d) None of the above
Explanation
When the winter temperature is below 0°C, the water in the lake will start freezing. The frozen ice will float at the top and cover the lake. Since ice is a bad conductor of heat it does not allow heat to pass through it. So, the water below the ice remains in liquid form, where most of the aquatic life lives. This enables the aquatic animals and plants to survive even in extreme cold conditions.

21. What is the density of water at 4°C?
a) 1g/cc
b) 0.91g/cc
c) > 1g/cc
d) 0.97 g/cc
Explanation
Density of water at different temperature

Temperature	Density
0°C	0.91 g/cc (ice)
0°C	0.97 g/cc (water)
4°C	1 g/cc
>4°C	< 1 g/cc

22. Which is an unusual property of water?
a) For the same mass value the volume of ice is more than water.
b) Density of ice is higher than water.
c) Freezing lowers the volume of water.
d) Water solutes all the solid substances.
Explanation

For the same mass of ice and of water, the volume of ice is more than that of water. It is an unusual physical property of water. In the Himalayas the temperature can go down even below 0°C. The water in the water pipes will freeze at this temperature to ice. If the pipes are not strong they can crack, develop leaks or even burst. This is because freezing of water will cause an expansion in the volume.

23. Assertion (A): A thermometer does not register any temperature variation if an ice cube is heated.
Reasoning (R): The heat energy is utilized by the state of change from solid to liquid.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Latent heat of fusion of ice: If ice cubes are heated in a beaker in which a thermometer is placed, the thermometer does not register any rise in temperature till all the ice melts. The question arises where the heat energy goes if there is no rise in temperature. The heat energy is utilized in changing the state of ice from solid to liquid.

24. Which of these have the highest latent heat of fusion?
a) Camphor
b) Saline water
c) Ice
d) Pure water
Explanation
The amount of heat energy required by ice to change into water is called latent heat of fusion of ice. Ice has the highest latent heat of fusion, i.e., 80 calories/g. or 336 J/g.

25. Assertion (A): Ice is used to maintain the freshness of the food for longer time.
Reasoning (R): The high latent heat fusion value of ice absorbs the heat from the food when it melts.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
The freshness of fish and meat can be maintained by placing them in contact with ice. With its larger latent heat, ice is able to absorb a large quantity of heat from the fish as it melts. Thus, food can be kept at a low temperature for an extended period of time.

26. Which of these have the highest latent heat of vaporization value?

a) Steam
b) Frozen ice
c) Pure water
d) Sterilized water
Explanation
Latent heat of vaporization of water
When water attains the temperature of 100°C, it starts changing its state from liquid to gaseous state. However, the temperature of water does not rise above 100°C. It is because the supplied heat energy only changes the state of the boiling water. This heat energy is stored in steam and is commonly called latent heat of vaporization of steam. The steam has the highest latent heat of vaporization and its value is 540 calories/g or 2268 J/g.

27. Which of these property of water takes time to become hot or cold?
a) Latent heat of vaporization
b) Latent heat of fusion
c) Specific heat capacity
d) Universal solvent
Explanation
Specific heat capacity: The amount of heat that is needed to raise the temperature of a unit mass of a substance by 1°C is called specific heat capacity of that substance. The specific heat capacity of water is very high. One gram of water requires 1 calorie of heat to raise its temperature by 1°C. Due to its high specific heat capacity, water takes time to become hot as well as to cool down. Thus, water can absorb a lot of heat and retain it for a longer time.

28. Which of these mechanisms use the specific heat capacity property of water?
a) Engine cooling systems
b) Food preservation
c) Hydro power stations
d) Cleaning systems
Explanation
The property of specific heat capacity of water is used to cool engines. Water is circulated around car engine using the radiator pump and the heat is absorbed. Thus the engine is protected from getting too hot.

29. Which form of water does not react with litmus paper?
a) Pure water
b) Sea water
c) Rain water
d) Sterilized water
Explanation

Pure water is neutral and it shows no action towards litmus paper.

30. At which of this temperature the water decomposes to form hydrogen and oxygen gas?
a) 32°C
b) 100°C
c) 2000°C
d) 200°C
Explanation
Water is a very stable compound. It does not decompose into elements, when heated to ordinary temperatures. However, if it is heated to 2000°C, 0.02% of water decomposes to form hydrogen and oxygen gas.

31. Assertion (A): Hydrogen with water traces react with sunlight and cause explosion to produce hydrogen chloride.
Reasoning (R): Dry hydrogen and chlorine gases do not react in the presence of Sunlight.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Water acts as a catalyst in a number of reactions. Perfectly dry hydrogen and chlorine gases do not react in the presence of sunlight. However in the presence of traces of water, the reaction takes place with explosion to produce hydrogen chloride.

32. Which of these metals does not react vigorously with water at room temperature?
a) Sodium
b) Potassium
c) Iron
d) Calcium
Explanation
Water reacts with some metals. Metals such as sodium, potassium and calcium react vigorously with water at room temperature.

33. In which of this reaction the hydrogen gas burns due to the heat?
a) Magnesium with hot water
b) Sodium with water
c) Potassium with water at room temperature.
d) All the above
Explanation

Sodium reacts with water to form hydrogen gas and sodium hydroxide solution. Due to the heat evolved in this reaction the hydrogen (gas) catches fire and burns.
$2Na + 2H_2O \; 2NaOH + H_2$

34. What is the chemical reaction of magnesium and hot water?
a) Hydrogen
b) Oxygen
c) Magnesium Hydroxide
d) Both a and c
Explanation
Magnesium is little more sluggish. It reacts with hot water and gives hydrogen and magnesium hydroxide solution.
$2Mg + 2H_2O \; Mg(OH)_2 + H_2$

35. Choose the correct statements.
i) Iron is the only metal which forms iron oxide with water called as rust.
ii) Corrosion is an immediate process of iron rusting.
iii) Iron is used to construct buildings, factories, bridges and vehicles.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Many other metals react with water to form oxides and hydroxides. Iron is one such metal which forms iron oxide, called rust. Iron is used in many buildings, factories, bridges, ships and vehicles. The slow and gradual rusting of iron is called corrosion.

36. Assertion (A): Copper is mostly used for making pipes and boilers.
Reasoning (R): Copper does not react with water at any temperature.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Copper does not react with water at any temperature. That is why it is used for making pipes and boilers.

37. Which of these dissolves in water and produces hydrochloric acid?
a) Chlorine gas
b) Hydrogen gas

c) Hydrogen Sulphide
d) None of the above
Explanation
Chlorine gas dissolves in water and produces hydrochloric acid.
$2Cl_2 + 2H_2O$ Sunlight $4HCl + O_2$

38. Name the substance which dissolves other molecules and compounds?
a) Solvent
b) Solute
c) Solution
d) Salt
Explanation
A solvent is a substance which dissolves other molecules and compounds. For example, in a salt solution, water is the solvent and salt is the solute.

39. Choose the correct statements.
i) Water is called as the Universal solute.
ii) Water has the unique property of dissolving more substances than any other liquids.
iii) Water dissolves only solid substances like salt and sugar.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Water has a unique property to dissolve more substances than any other liquids. It can dissolve solids such as salt and sugar, liquids such as honey and milk and gases such as oxygen and carbon dioxide in it. Water can dissolve more number of substances than any other solvent. Therefore, it is called as universal solvent.

40. Which of these is the reason for the concentric rings in evaporated water?
a) Salts
b) Minerals
c) Impurities
d) All the above
Explanation
You can see a number of concentric rings of solid matter deposited on the watch glass. These are the dissolved solids left behind after the evaporation of water. Salts, minerals and impurities are the solids dissolved in water.

41. Which of these is not true regarding the dissolved salts in water?

a) Dissolved salts are essential for the plant growth.
b) Does not add taste to the water.
c) Essential minerals supply for the human body.
d) Used for some important chemical reactions in human cells.
Explanation
Dissolved salts are important for the following reasons.

- They are essential for the growth and development of plants.
- They add taste to water.
- They supply the essential minerals needed for our bodies.
- Most of the chemical reactions important for our living take place in the cells of our body with the help of water.

42. Choose the correct statements.
i) River water and tap water forms concentric rings after evaporation.
ii) Rain water and the distilled water do not contain any salts.
iii) River water, tap water and well water contains dissolved salts.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Tap water, river water and well water contain dissolved solids but rainwater and distilled water does not contain dissolved solids. Hence concentric rings are not formed in the rain water and distilled water after evaporation.

43. Assertion (A): Air is present in the dissolved state in fresh water sources only.
Reasoning (R): Dissolved air is used for living organisms and the aquatic plants.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is False but R is True.
d) Both A and R is False.
Explanation
Apart from solids and minerals, air is also dissolved in water. Air is present in dissolved state in all natural sources of water.

44. What is the approximate percentage of dissolved oxygen in water?
a) More than 50%
b) 75%
c) 35%
d) Less than 20%

Explanation

The solubility of oxygen in water is higher than the solubility of nitrogen. Air dissolved in water contains approximately 35.6% oxygen along with nitrogen and carbon dioxide.

45. List the importance of air dissolved in water.

i) Important for the living organisms in water.

ii) Aquatic plants use dissolved carbon dioxide for photosynthesis.

a) i only

b) ii only

c) Both i and ii

d) Neither i nor ii

Explanation

Air being dissolved in water is important for the following reasons.

- Air dissolved in water is important for the living organisms to survive.
- Fish extracts the oxygen from the water and expels water through the gills. Fish can survive in water only through the dissolved oxygen present in water.
- Aquatic plants make use of dissolved carbon dioxide for photosynthesis.

46. Which of these react with the limestone and forms calcium bicarbonate?

a) Oxygen

b) Hydrogen

c) Carbon dioxide

d) Zinc

Explanation

Carbon dioxide dissolved in water reacts with limestone to form calcium bicarbonate. Marine organisms such as snails, oysters, etc., extract calcium carbonate from calcium bicarbonate to build their shells.

47. Choose the Incorrect statements.

i) Dead sea has a single source of water which is connected to the sea.

ii) The water salinity is more than in the Dead Sea.

iii) Marine life is not possible in the Dead Sea due to the steady increase in the salinity.

a) i only

b) ii only

c) iii only

d) None of the above

Explanation

The salinity of water is more in the Dead Sea. It is actually a salt lake as it has a single source of water and is not connected to the ocean. It is landlocked and this causes the water to evaporate.

This has led to a steady increase in its degree of salinity. Now the salinity is so high such that the marine life cannot survive in it. This is why it is called the Dead Sea.

48. Which of these is not a quality of non-potable water?
a) Also known as saline water.
b) Contains minerals for taste.
c) Not suitable for drinking.
d) Mostly contain Sodium chloride.
Explanation
Saline water contains salt commonly known as sodium chloride (NaCl). Such water is called saline water. It is not suitable for drinking and is said to be non-potable water.

49. Assertion (A): Water suitable for drinking is called as potable water.
Reasoning (R): Every one liter of potable water contains dissolved salts.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
The water suitable for drinking is called potable water. Every liter of potable water contains 1- 2 grams of dissolved salts, mainly common salt.

50. State some of the minerals found in potable water?
a) Magnesium
b) Potassium
c) Zinc
d) All the above
Explanation
In addition to the common salt, there are small amounts of calcium (Ca), magnesium (Mg), potassium (K), copper (Cu) and zinc (Zn). The minerals in water give it a certain taste. In addition, these minerals are useful for our body's metabolism. Potable water also contains dissolved air.

51. What are the characteristics of the potable water?
a) Colorless, Odorless and transparent.
b) Free from harmful micro-organisms.
c) Have some minerals, salts and some dissolved gas for taste.
d) All the above
Explanation
The following are the characteristics of potable water.
- Potable water should be colorless and odorless.

- It should be transparent.
- It should be free from harmful micro-organisms such as bacteria, virus and protozoa.
- It should be free from suspended impurities.
- It should contain some minerals and salts, necessary for our body and some dissolved gases to add taste.

52. What is the approximate percentage of fresh water available in rivers and lakes?
a) 30%
b) 1%
c) 25%
d) 60%
Explanation
Out of the total fresh water available on the earth only 1% is present in water bodies such as rivers and lakes and the rest is frozen in glaciers and polar-regions.

53. Which of these is not a water borne disease?
a) Typhoid
b) Cholera
c) Asthma
d) Diarrhea
Explanation
Water from these water bodies is unfit for drinking, cooking, washing or bathing because it contains suspended and dissolved impurities. It also contains micro-organisms such as bacteria. If this water is consumed without purifying, it can cause water-borne diseases such as typhoid and cholera. Therefore, before water reaches our homes, it is treated and purified to make it potable. In conventional water treatment plants water is subjected to different processes for purification.

54. Which of these are added in the process of loading to speed up the sedimentation?
a) Potash alum
b) Chlorine
c) Ozone
d) Carbon dioxide
Explanation
Water from lakes or rivers is collected in large sedimentation tanks. There, it is allowed to stand undisturbed so that suspended impurities settle down at the bottom of the tank. Sometimes, a chemical substance such as potash alum is added to water, to speed up the process of sedimentation. This process is called loading. The particles of potash alum combine with the suspended impurities and make them settle down at a faster rate.

55. Which of these layers are present in a water filtration tank?

a) Gravel
b) Concrete
c) Activated charcoal
d) All the above
Explanation
Water from the sedimentation tanks is then pumped to the filtration tanks. Filtration tanks contain filter beds made up of gravel, sand, pebbles, activated charcoal and concrete. Water passes through these layers and becomes free from any remaining dissolved or suspended impurities completely.

56. Choose the correct statements.
i) Filtered water is treated chemically to remove the bacteria and the germs.
ii) Chlorine and ozone are the chemicals used in the sterilization process.
iii) Chlorination is the process of adding adequate amount of chlorine to remove bacteria and germs.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
The filtered water is treated chemically to remove the remaining germs or bacteria. This process is called sterilization. The chemicals that are used in this process are chlorine and ozone. The process of adding chlorine in adequate amounts to water is called chlorination. The water from filtration tanks is pumped into chlorination tanks, where chlorine is added to remove harmful bacteria and other germs.

57. Which is used to kill the germs in water in the Ozonization process?
a) Chlorine
b) Carbon dioxide
c) Ozone gas
d) Nitrogen
Explanation
Ozonization is a process in which water is treated with ozone gas to kill the germs present in it.

58. Assertion (A): Sterilization is done by exposing water to air and sunlight.
Reasoning (R): Oxygen from air and sunlight destroy the germs in the water.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation

The sterilization of water can also be done by exposing it to air and sunlight. Oxygen from the air and sunlight destroy the germs present in water.

59. Which of the process uses air under pressure to kill germs in the water?
a) Filtration
b) Distillation
c) Aeration
d) Purification
Explanation
Aeration is the process in which air under pressure is blown into filtered water. This also helps to kill the germs.

60. Which of these statements are not true about the RO purifiers?
a) Purifiers to remove the dissolved impurities and germs.
b) It does not improve the taste of the water.
c) Reverse Osmosis technology is used in these purifiers.
d) Some purifiers have Ultraviolet unit to destroy the germs in the water.
Explanation
RO purifiers are the purifiers that can remove the dissolved impurities and germs. They also improve the taste of water. RO stands for the name of the technology, reverse osmosis, used in these purifiers. Some RO purifiers also have a UV (ultraviolet) unit that destroys the germs present in water.

61. In which of these water soaps and detergents forms lather easily?
a) Soft water
b) Distilled water
c) Hard water
d) Sea water
Explanation
We use soaps and detergents to wash clothes. They form lather with water that quickens the process of removal of dirt from the clothes. Water contains a number of dissolved salts and minerals. When these salts are present in very small quantities in water it is called soft water. In this water, soaps or detergents form lather easily.

62. Which of these makes difficult to remove the dirt from the hard water?
a) Scum
b) Lather
c) Temperature
d) All the above
Explanation

Sometimes, minerals and salts are present in water in such a large quantity that soaps or detergents form a thick precipitate called scum instead of forming lather. This makes the removal of further dirt difficult. Such water is called hard water.

63. Assertion (A): The Hardness of water may be temporary or permanent.
Reasoning (R): The dissolved salts of calcium and magnesium are the reason for the hardness of water.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Hardness of water is due to the presence of dissolved salts of calcium and magnesium. Hardness may be temporary or permanent.

64. Choose the correct statements.
i) The permanent hardness of the water is due to the chloride salts of calcium and magnesium.
ii) The presence of carbonate and bicarbonate salts of calcium and magnesium makes the water hard.
a) i only
b) ii only
c) Both i and ii
d) Neither i nor ii
Explanation
Temporary hardness is due to the presence of carbonate and bicarbonate salts of calcium and magnesium and permanent hardness results due to the presence of chloride and sulphate salts of calcium and magnesium.

65. What are the disadvantages of the hard water?
a) Usage of soap is ineffective and it spoils the clothes.
b) Stomach ailments for human if consumed for a long period.
c) Forms scales on Industrial machineries.
d) All the above
Explanation
Disadvantages of Hard water

- It is not good for washing clothes. It forms scum with soap and detergents, which makes the soap ineffective and also spoils the clothes further.
- It damages the utensils and containers in which it is stored and forms a hard layer.
- It forms scales on the machine parts used in industries and decreases their efficiency.
- It results in stomach ailments if consumed for a long period.

66. Which of these can be easily removed by boiling the water?
a) Temporary hardness
b) Permanent hardness
c) Salts
d) Minerals
Explanation
Boiling: Temporary hardness is easily removed from water by boiling. When heated, the calcium hydrogen carbonate decomposes producing insoluble calcium carbonate. The insoluble carbonates are then filtered and removed from water. This makes the hard water soft and fit for use.

67. Choose the correct statements.
i) Washing soda is used to remove temporary and permanent hardness of water.
ii) Washing soda converts the chlorides and sulphates into insoluble carbonates.
iii) The insoluble carbonates are removed by distillation method.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Adding washing soda: Washing soda is used to remove permanent hardness of water. Adding washing soda converts chlorides and sulphates into insoluble carbonates. These insoluble carbonates are removed by filtration.

68. Assertion (A): Ion-exchange method converts hard water into soft water.
Reasoning (R): The calcium and magnesium ions are replaced by sodium ions in ion-exchange method.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation
Ion – exchange: Another method used to remove the hardness of water is to pass it through a column of ion-exchange resins where calcium and magnesium ions get replaced by sodium ions. This converts hard water into soft water.

69. Choose the Incorrect statements.
i) Water obtained after distillation is called as distilled water.
ii) Distillation process removes the permanent hardness of the water.
iii) Distilled water is the purest form of water.

a) i only
b) ii only
c) iii only
d) None of the above
Explanation
Temporary and permanent hardness both can be removed by the method of distillation. The water obtained after distillation is called distilled water. It is the purest form of water.

70. Which of these is not the reason for taste of the water?
a) Air
b) Metals
c) Carbon dioxide
d) Minerals
Explanation
Distilled water and boiled water have no taste. The pleasant taste of drinking water is due to the presence of dissolved substances which include air, carbon dioxide and minerals.

71. Which of these statements are not true regarding the water pollution?
a) Water contamination is due to the harmful substances as chemicals, sewage and wastes.
b) Contamination results only the chemical change in the quality of water.
c) Contamination of water degrades the water quality.
d) Polluted water is toxic to living organisms.
Explanation
Contamination of water bodies as a result of human activities is known as water pollution. Contamination of water bodies occur when harmful substances such as chemicals, sewage and waste are released into them. Contamination produces physical, chemical and biological change in the quality of water. It degrades the water quality and renders it toxic to living organisms. Drinking polluted water has serious negative effects on human health.

72. Choose the incorrect statements.
i) Fresh water sources are useful for domestic, agricultural and industrial usage.
ii) Surface water is the only source of fresh water.
iii) Rivers, reservoirs and tanks are the examples of fresh water sources.
a) i only
b) ii only
c) iii only
d) None of the above
Explanation

Fresh water resources are the sources of water that are useful to society for domestic, agricultural or industrial uses. These include surface and ground water. Examples of surface water include rivers, reservoirs, Eris and tanks.

72. How many major river basins are there in Tamil Nadu?
a) 17
b) 61
c) 300
d) 40,000
Explanation
There are 17 major river basins in Tamil Nadu with 61 reservoirs and approximately 41,948 tanks. Eris and tanks are traditionally used in Tamil Nadu to collect rainfall during the monsoon which can be used throughout the year.

73. Which of these are called as aquifers?
a) Surface water sources
b) Rain water
c) Ground water sources
d) Glaciers
Explanation
Groundwater sources are called aquifers. Aquifers are layers below the ground made of coarse and gravel that contain spaces allowing rainwater collection. The use of groundwater is possible through open wells and bore wells.

74. Which of these substances pollute the water bodies?
a) Micro beads
b) Micro-organisms
c) House hold wastes
d) Organic wastes
Explanation
Shampoo, face wash, shower gel and toothpaste have small round pieces of plastic added to them. These are called micro beads. They are added for different reasons like scrub and clean your skin, polish your teeth etc. When we use products with micro beads, they go down our drain and pollute water bodies. Fish and other animals eat them by accident and get sick.

75. What is called as Eutrophication?
a) Excess toxic substances by Industrial wastes.
b) Untreated water wastes polluting the major water bodies.
c) Excess of nutrients due to fertilizers, pesticides and insecticides.
d) Recycling method of water wastes.

Explanation

Fertilizers, pesticides and insecticides used in agriculture can dissolve in rainwater and flow into water bodies such as rivers and lakes. This causes an excess of nutrients such as nitrates and phosphates as well as toxic chemicals in water bodies which is called Eutrophication and they can also be harmful to aquatic life.

76. Which of these substances are released as toxic waste by Industries?

a) Mercury

b) Lead

c) Cyanides

d) All the above

Explanation

Many industries release toxic waste such as lead, mercury, cyanides, cadmium, etc. If this waste is unregulated and is released into water bodies it negatively impacts humans, plants, animals and aquatic life.

77. Which of these is not a domestic pollutant?

a) Sodium sulphates

b) Plastic fibers

c) Micro beads

d) DDT

78. Which of these are pollutants from the domestic detergents?

a) Lead

b) Sodium sulphates

c) Nitrates

d) Cadmium

Explanation

Pollutants	Sources	Effects
Domestic		
Sodium sulphates and phosphates	Detergents	In humans they cause developmental, reproductive and neuro toxicity and endocrine disruption. Phosphates make bacteria and algae grow faster, and use up all the dissolved oxygen. This leads to a decrease in animal and plant diversity.
Plastic fibres and microbeads	Plastic clothing and hair, beauty and skin products	These end up in water bodies such as lakes, rivers and the ocean. Here they attract toxic chemicals. Marine animals often eat them as they confuse them as their natural source of food and the toxins can move up the food chain.

79. What are the negative effects of the DDT used for agricultural purpose?
a) Affects the nervous system of animals and human.
b) Accumulates in the food chain.
c) Mostly create an impact in the top predators.
d) All the above

80. Assertion (A): Fertilizers used for agricultural purposes decrease the animal and plant diversity.
Reasoning (R): Bacteria's and algae uses these fertilizers to grow faster and use all the dissolved oxygen in water.
a) Both A and R is True and R is the correct explanation of A.
b) Both A and R is True but R is not the correct explanation of A.
c) A is True but R is False.
d) Both A and R is False.
Explanation

Agriculture		
DDT	Insecticides	If affects the central nervous system of insects, animals and humans. It accumulates in the food chain and impacts the top predators the most.
Nitrates and phosphates	Fertilisers	Bacteria and algae grow faster and they use up all the dissolved oxygen and this leads to a decrease in animal and plant diversity.

81. Which of these are the major pollutants from the industrial sectors?
a) Mercury
b) Cadmium
c) Arsenic
d) All the above

82. What are the effects of the Industrial pollutants?
a) Pollutes potable ground water.
b) Negative impact in human health.
c) Toxic to aquatic animals and plants.
d) All the above

83. Which of these industries is the major cause for pollution?
a) Textile Industries
b) Leather Industries

c) Chemical Industries
d) All the above
Explanation

Industrial		
Lead, Mercury, Cadmium, Chromium and Arsenic	Chemical, textile and leather industries and leachate from open dumping of solid waste	Toxic to animals, plants and bacteria in the water. Pollutes potable ground water. Negatively impacts human health.

84. What are the effects of oil spills on the water surface?
a) Reduces the dissolved oxygen in water.
b) Harmful to aquatic life.
c) Sun light is blocked on the water surface.
d) All the above
Explanation
Oil spills cause water pollution which is harmful to aquatic life. The oil which remains floating on the water surface blocks sunshine, reduces the oxygen dissolved in water and suffocates marine organisms.

85. Choose the Incorrect statements.
i) Thermal and Nuclear power plants use a large amount of water for cooling purposes.
ii) The water from nuclear and thermal plants is discharged back to the water source at a very low temperature.
iii) The chemicals and the temperature rise in the discharges water decrease the dissolved oxygen in the water.
a) i only
b) ii only
c) iii only
d) All the above
Explanation
Large amounts of water are used for cooling purposes in thermal and nuclear power plants and many industries. Water used for cooling purposes is discharged back to a river or to original water source at a raised temperature and sometimes with chemicals. This rise in temperature decreases the amount of oxygen dissolved in water which adversely affects the aquatic life.

86. Which is not a major category of pollutants?
a) Domestic pollutant
b) Agricultural pollutant
c) Organic Pollutants

d) Industrial pollutant

Explanation

Pollutants are generally classified as domestic pollutants, agricultural pollutants and industrial pollutants.

87. Choose the correct statements.

i) Micro-plastics are found only in bottled water and tap waters around the world.

ii) Micro-plastics can be found in almost every saline water source.

a) i only

b) ii only

c) Both i and ii

d) Neither i nor ii

Explanation

Micro-plastics can be found in almost every freshwater source. They have been found from the freezing waters of the Arctic and Antarctic to the bottom of the deep-sea floor up to 5,000 meters deep. Micro plastics have been found in bottled water and tap water around the world.

88. What is the major source of water pollution in India?

a) Untreated sewage

b) Agricultural wastes

c) Household wastes

d) Inorganic pollutants

Explanation

The largest source of water pollution in India is untreated sewage. On an average, a person uses 180 liters of water per day for washing clothes, cooking, bathing, etc.

89. What are the methods used for reducing water pollution?

a) Re-treating domestic waste water

b) Bio-pesticides

c) Biodegradable detergents

d) All the above

Explanation

Some simple ideas to avoid water pollution are given below:

- Use detergents that are biodegradable and avoid those that contain toxic chemicals.
- Wear clothing that is made from natural fibres such as cotton and avoid wearing synthetic fibres such as nylon.
- Domestic waste water should be treated properly, and all harmful substances should be removed from it, so it can be reused for flushing toilets and gardening.
- Use bio-pesticides (natural pest control) instead of chemical pest control.
- Use compost made from cow dung, garden waste and kitchen waste as a fertilizer.

- Water released from industries should be treated before being discharged.

90. Which of these is not a category of wastes?
a) Recyclable wastes
b) Biodegradable wastes
c) Agricultural wastes
d) Non-recyclable wastes
Explanation
Do not throw waste such as plastics into water bodies. Always separate your waste into recyclable, non-recyclable and biodegradable so that it does not cause pollution.