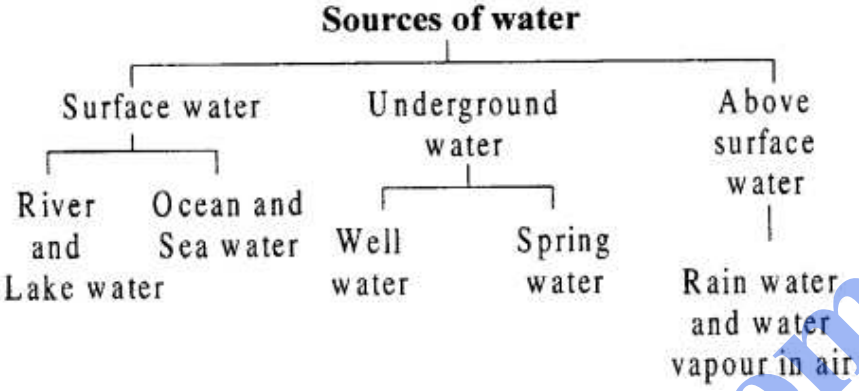
Water

POINTS TO REMEMBER

1. Water cannot be replanished and without water we cannot live.
2. 4 / 5 th of earth's surface is covered with water and 1% of this available water is in the form of rivers, lakes, ponds and under ground water. It is utilized for agriculture and living beings consumption.
3. In the atmosphere water is present in the form of vapour, mist, clouds etc.



4. Distillation : The process of removal of the dissolved salts from sea/ocean water.
5. Purest form of water is rain water as it is formed by evaporation and condensation.
6. Sea water is unfit for agriculture as plants do not tolerate saline water.
7. Change of water from water bodies (lakes, rivers and oceans) into vapours in air and condensing of vapours and fall in the form of snow, water is called water cycle and water cycle plays an important role in
   (i) restoring the lost water from earth's surface
   (ii) in controlling the climatic conditions.
8. Water vapour is one of the invisible gases which makes up the air we breathe.
9. Drinking water may contain some minerals and salts but it must be free from suspended impurities, harmful bacteria and germs.
10. Sometimes water from a source look clear but may contain germs which cause water borne diseases like typhoid, cholera, jaundice, dysentry, gastroenteritis etc.
11. Water can be made fit for drinking by
    (i) boiling,
    (ii) sterilisation
    (iii) exposing to air and sunlight
    (iv) by chemical treatment like chlorination or ozonisation.
12. Water is universal solvent i.e. water can dissolve nearly in every substance.
13. Distilled water is the purest form of water but not good for drinking purposes. It is good for medicinal purposes, laboratories and batteries.
14. Both stirring and heating help in dissolving the substance in water.
15. "The amount of solute that dissolves in a given quantity of solvent at a given temperature is called solubility of the solute."
16. Air dissolved in water helps aquatic animals and plants to survive.
17. **Eutrophication:** "The deficiency of oxygen in the water may cause death of aquatic animals. This loss of dissolved oxygen from water in water bodies is called eutrophication."

EXERCISE-I

Question 1.
Name:

(a) Three major sources of natural water
(b) Four sources of surface water.
(c) Two underground sources of water.

Answer:

(a) Three major sources of natural water :

1. Surface water (sea water)
2. Above surface water (rain)
3. Underground water (springs)

(b) Four sources of surface water sources :

1. Ocean water
2. River water
3. Lake water
4. Glaciers

(c) Two sources of underground water :

1. Well water
2. Spring water

Question 2.
Answer the following questions in short:

(a) In which form is water present in the atmosphere ?
(b) Which source of water contains the highest concentration of salt in it ?
(c) Why is rain water considered the purest form of natural water?
(d) What possible impurities does rain water contain ?
(e) What is water table ?
(f) Why is spring water pure enough for drinking but unsuitable for laboratory use ?
(g) Why the taste of spring water differs at different places ?

Answer:

(a) Water is present in the form of water vapours in the atmosphere.
(b) Sea water contains highest concentration of salt.
(c) Rain water is the purest form of water as it is distilled water i.e. water from surface of earth has evaporated and then vapours condense in the atmosphere.
(d) The impurities present in rain water are dust and dissolved gases like oxygen, nitrogen and carbon dioxide and these gases are not poisonous, rain water is safe for drinking.
(e) Level of ground water is called water table.
(f) Spring water is free from suspended impurities and germs (harmful bacteria) as water has been filtered through different layers of soil and is fit for drinking. Spring water contains dissolved impurities which are due to the nature of soil surrounding the spring and cannot be used for laboratory purposes, where distilled water free from impurities is needed.
(g) Spring water contains unsolved impurities which have entered the water from surrounding soil and soil impurities (salts) differ from place to place. Hence taste of water differs from place to place.

Question 3.
List three major impurities present in river water.
Answer:
Three major impurities present in river water :

1. Suspended impurities like clay and sand particles.
2. Harmful bacteria.
3. Mineral salts.

Question 4.
Give the percentage of water in the following :

(a) Rice and wheat grains
(b) Eggs
(c) Tomatoes
(d) Bread
(e) Water melon

Answer:
Percentage of water in :

(a) Rice — 3 % to 4% Wheat grain — 3% to 4%
(b) Eggs —75%
(c) Tomatoes — 95%
(d) Bread —25%
(e) Water melon — 97%

Question 5.
What are the three states of water ?
Answer:
Three states of water are :

1. Ice (solid)
2. Liquid (water)
3. Gaseous (steam)

Question 6.
Why are ice, liquid water and steam considered to have the same chemical substance ?
Answer:
Ice, liquid water and steam have same composition i.e. 2 parts hydrogen and one part oxygen by volume and same formula H_2O, can be easily transformed from one state to other by heating or cooling.

Question 7.
How is a cloud formed ?
Answer:
Water from the surface of earth, lakes, seas, rivers, formed by plants (transpiration) etc. evaporates and rises high up in the atmosphere and condense into water droplets and collect to form cloud.

Question 8.
What is water cycle ? What is its importance ?
Answer:
Water cycle : The change of water from one form to another in nature which results in continuous circulation of water from earth's surface to the atmosphere and from the atmosphere back to the earth's surface is called water cycle.
Importance of water cycle:

1. It assures a continuous supply of water to us.
2. In controlling the climatic conditions all over the world.

Question 9.
How are the following formed ?

(a) fog
(b) mist
(c) dew
(d) frost

Answer:

(a) Fog : When water vapours change into tiny droplets of water near the ground, fog is formed.
(b) Mist: When tiny droplets of water remain suspended in air it is called mist.
(c) Dew : When the water vapour condenses on cold objects like grass, leaves and flowers in winter in the form of tiny droplets of water called dew.
(d) Frost: When the dew freezes it is called frost.

EXERCISE-II

Question 1.
Name:

(a) Two chemicals used to destroy germs present in water.
(b) Two diseases which spread through impure water.
(C) A chemical used for loading.
(d) Two substances which add taste to water.
(e) Two household methods to get safe drinking water.

Answer:
(a) Two chemicals used to kill germs in water are:

1. Chlorine.
2. Potassium permanganate.
3. terilizing water with ozone.

(b) Two diseases are cholera, dysentry.
(c) Chemical used for loading is potash alum.
(d) Minerals and carbon dioxide gas adds taste to water.
(e) Methods to get safe drinking water:

1. Adding chlorine tablets.
2. By adding potassium permanganate crystals.

Question 2.
Answer in brief:

(a) Why is river water unfit for drinking?
(b) Why is tap water a mixture?
(c) What is mineral water?
(d) What is the purpose of adding bleaching powder to water supplied to the town?
(e) How is chemically pure water obtained in the laboratory?
(f) how is water in swimming pool kept free a germs?

Answer:

(a) River water contains mineral salts, suspended impurities like clay, sand particles, organic matter and bacteria and is not fit for drinking.
(b) Tap water contains, minerals, air, chlorine and other dissolved impurities that varies from place to place, therefore it is a mixture.
(c) Mineral water is pure water fit for drinking. It is collected from natural source and contains air, minerals and salts free from suspended impuiities, harmful bacteria and germs.
(d) Adding bleaching powder to water, kills germs and harmful bacteria and viruses present in water.
(e) Chemically pure water for laboratories is obtained-by distillation. Distilled water does not contain any salt or mineral
(f) Water in swimming pool kept free from infections and germs by chlorination i.e. treating water with chlorine gas.

Question 3.
Define:

(a) Sterilisation
(b) Sedimentation
(c) Loading
(d) Aeration

Answer:

(a) Sterilisation : The process of removal of microorganisms including bacterial spores from water to avoid water borne diseases is known as sterilisation.
(b) Sedimentation : The setting of suspended solid matter at the bottom of a liquid is called sedimentation.
(c) Loading : The process of adding a chemical to an impure liquid in order to increase the speed of sedimentation of suspended particles is called loading.
(d) Aeration : To kill harmful micro-organisms present in filtered water, air underpressure is blown into the filtered water. This process is called aeration.

Question 4.
What is potable water ? List four characteristics of potable water.
Answer:
Potable water : Water fit for drinking purposes is called potable water.
Four characters of drinking water :

1. It should be transparent.
2. Should have no colour, no odour.
3. Should be free from harmful bacteria and germs.

4. It should contain same salts and minerals needed by the body CO_2 to add to taste.

Question 5.
Why is water important for plants and animals?
Answer:
Importance of water for plants:

1. Plants need water to prepare their food, for germination and growth to produce fruits, flowers etc.
2. For conduction of food prepared by plants to other-parts of plant i.e., for translocation.
3. Large number of plants live in water; water provides nutrients and oxygen for their survival.
   Crops need water for their growth. Water in the form of rain, washes the dust and smoke deposited on leaves by vehicles and helps the stomata in exchanging gases.

Importance of water for animals:

1. Lot of water is lost by the body of animals by sweating, in the form of urine and evaporation while doing various activities, so to make up for the lost water animals consume a lot of water in the form of drinking.
2. Water keeps the animals fresh and is natural medicine for their many ailments.
3. Water is good solvent and helps in the process of digestion, blood circulation, excretion etc. in the body of organisms.
4. Water is essential for the cleanliness of animals and their surroundings.

Question 6.
What are the three methods of removing germs from natural water. Explain.
Answer:
Three methods to remove germs :

1. **By boiling :** Boiling kills germs present in water.
2. **Adding potassium permaganate:** By adding potassium permaganate in the well the germs can be killed.
3. **Chlorination:** After filtration water is passed through chlorination tank here chlorine kills the germs.

Question 7.
Name the steps involved in the purification of drinking water supplied in cities and towns.
Answer:
The water source for our towns and cities are river, lakes or underground water which contains suspended and dissolved impurities.
To remove these impurities steps involved are:

1. **Loading and sedimentation :** to settle the suspended impurities to form a sediment for this purpose potash alum is added.
2. **Filtration :** The water still contains lighter suspended impurities which are removed by filtration through sand and gravel. In cities ground water is drawn from tube well or submurcible pumps which have filters fitted in them. This clear water still contains germs.
3. **Chlorination :** To kill germs water is passed into chlorination tank where it is treated with chlorine to kill germs.
   Water is now potable i.e. safer for drinking and supplied to homes.

Question 8.
What is the taste of distilled water ? Why is it not potable?
Answer:
Taste of water is tasteless i.e. flat. It is because distilled water does not contain any salt or mineral required for our body. So it is not potable water.

Question 9.
Give reasons :

(a) Ice floats on water.
(b) Marine life is able to survive in colder regions.
(c) Water droplets can be seen outside a chilled water bottle.

Answer:

(a) Water has maximum density at 4°C. Ice is lighter than water therefore it floats on water.
(b) This anomalous property of water enables aquatic plants and animals to survive in colder regions of world because even when the water of ponds, lakes, river freezes it freezes on the top but remains a liquid below ice layer.
(c) Sometimes we see water droplets on the outer surface of the glass containing ice-cold water, this is because the water vapour presents in'air, on coming in contact with the cold glass of water, loses energy and gets converted into liquid state, which we see as water droplets.

EXERCISE-III

Question 1.
Why is water called a universal solvent ?
Answer:
As water can dissolve in most of the substances, solids, liquid and gaseous. Therefore it is called universal solvent.

Question 2.
Define:

(a) Solute
(b) Solvent
(c) Solution
(d) Saturated solutions
(e) Unsaturated solutions

Answer:

(a) Solute : A solute is a substance that dissolves in a medium which can be water or any other substance. Solute is in smaller quantity in a solution.
(b) Solvent : A solvent is a medium in which a solute dissolves. It is in large quantity in a solution. Water is the most common solvent. The other solvents are alcohol, carbon tetrachloride etc.
(c) Solution : A solution is a homogeneous uniform mixture formed by a solute and a solvent.
(d) Saturated solution : When a solution cannot dissolve any more of solute at a given temperature, it is called saturated solution.
(e) Unsaturated solution : A solution that can take up more of the solute at a given temperature, is said to be an unsaturated solution.

Question 3.
State two factors by which solubility of a solute in a solvent can be increased.
Answer:
Two factors are :

1. Stirring.
2. Increase in temperature.

Question 4.
Why do aquatic animals die in boiled water ?
Answer:
Boiled water is deprived of oxygen i.e. there is no oxygen. For want of oxygen animals die in boiled water.

Question 5.
State three differences between water and air.
Answer:
Differences between water and air :
Water :

1. Water is liquid and can exist in three states i.e. solid-ice, liquid-water, gas – vapours.
2. Is a compound.
3. H_2O is its formula.

Air :

1. Air is gaseous and can exist in liquid state when cooled under pressure.
2. Is a mixture.
3. Has no formula.

EXERCISE -IV

Question 1.
State four ways by which water can be conserved.
Answer:
Four ways to conserve water:

1. Do not allow water to drip from defective taps.
2. More dams should be built.
3. More plantation should be done as plants help in bringing rain.
4. Wastage of water should be avoided.
5. Close the tap when you are brushing your teeth. Rather use a mug. Close the tap when you are washing clothes, open the tap only when you need it. Reduce, Reuse and recycle should be our mantra

Question 2.
Explain harvesting of water.
Answer:
When it rains heavily water runs into streets, drains and wasted we can not make use of it. Our purpose is to catch this rain water, store it for future use when we actually need it. For this harvesting of rain water should be done. Rain water is collected from the roofs and verandas of the buildings with the help of pipes and carried to tanks for storage and is used at the time of need when it is not raining.

Question 3.
What are the three main causes of water pollution?
Answer:
Three main causes of water pollution :

1. Addition of waste products from homes.
2. Addition of waste products from agriculture.
3. Addition of waste from industries.
4. Addition of sewage in water bodies.

Question 4.
State the main steps to be taken to prevent water pollution.
Answer:
Steps to be taken to prevent water pollution :

1. Trees and plants be planted along the banks of rivers and canals.
2. Bathing and cleaning of animals near or in water sources be not allowed.
3. Use of pesticides, insecticides, fungicides and fertilisers should be reduced.
4. The polluted water from industries should be treated first and then discharged into water bodies.
5. Use biodegradable detergents.
6. Water containing sewage should be passed through sewage treatment plants first and then this water should be used for irrigation.
7. Wells should be covered properly and washing and cleaning of clothes, utensils and animals should not be done near the well to keep them clean.

Question 5.
What are the causes of floods and drought?
Answer:
Problems cause by floods :

1. A rise in the level of water in dams, rivers, lakes etc.
2. Heavy rainfall also causes floods.
3. Floods cause extensive damage to crops, property, animal and human life.
4. Crop-fields, villages and"many low-lying areas get submerged under flood water.
5. Rains/floods also affect smaller animals living in the soil.

Problems cause by drought :

1. Crops may die, fodder may become scarce.
2. Living organisms of the soil die.
3. Animals may die, plants and trees will not survive.
4. Soil becomes dry, water level in rivers, lakes, dams etc. may fall. The ground water-level falls.
5. Drought displaces people from a large number of villages and towns.

Question 6.
State some of the ways in which you as an individual can conserve water.
Answer:
The ways in which we can conserve water are as follows :

1. Use a bucket for taking it.
2. Make sure, water does not overflow from overhead tanks of your house.
3. Close the tap when you are brushing your teeth.

4. Wash fruits, vegetable in a bowl of water, rather than under a running tap. Water used for washing vegetables may be used to water plants in the garden.

OBJECTIVE TYPE QUESTIONS

1. Fill in the blanks

(a) Water is a **universal;** solvent.
(b) Rainwater is the purest form of natural water.
(c) Sand and dust are suspended impurities in water.
(d) Sea water has high concentration of **salt (impurity).**
(e) Water covers nearly **4 / 5 th** of the surface of the earth.
(f) Evaporation of rain water leaves **NO** residue.
(g) Potash alum is the chemical added to water to remove the tiny suspended particles.
(h) A **solution** is a uniform mixture of a solute and a solvent.
(i) Ice, water and steam have different physical states but are chemically **identical.**
(j) Boiling kills most of the **germs** in water.
(k) The elements present in the molecules of water are **hydrogen** and **oxygen.**

2. Write True or False for the following statements

(a) Water is an element.
Answer. False
Correct: Water is aL compound.

(b) Tap water does not contain dissolved impurities.
Answer. False
Correct: Tap water contain dissolved impurities.

(c) Alum is commonly used for removing suspended impurities.
Answer. False
Correct : Alum is commonly used for settling down of suspended impurities.

(d) Distillation is a good method for purifying water for town supply.
Answer. False
Correct : Distillation is a good method-for purifying water for medicinal purpose.

MULTIPLE CHOICE QUESTIONS

Tick (√) the correct alternative from the choice given for the following statements:

1. Water content in human body is

1. **70%**
2. 75%
3. 80%
4. 90%

2. The purest form of natural water is

1. seawater
2. river water
3. **rainwater**
4. lake water

3. When the water vapour changes into tiny droplets of water near the ground, it is called

1. mist
2. dew
3. **fog**
4. frost

4. Water is a

1. **compound**
2. element
3. mixture
4. none of the above

5. Common salt is obtained from sea water by

1. distillation
2. crystallisation
3. **evaporation**
4. sublimation

6. Jaundice affects

1. heart
2. lungs
3. **liver**
4. kidney

7. Chlorination of water is done

1. **to kill the germs**

2. to remove the suspended impurities
3. to remove the dissolved impurities
4. none of the above

ADDITIONAL QUESTIONS FOR PRACTICE
Exercise

Question 1.
State the sources of water

(a) on the earth's surface
(b) below the earth's surface.

Answer:

(a) Sources of water on the earth's surface are —

1. **Snow, frost —** Snow and frost are the natural forms of water present. They are found in the solid state.
2. **Rain water —** The purest form of natural water almost free from impurities is rain water. Rain water may dissolve oxygen, nitrogen & carbon dioxide gas forming weak acids. In industrial regions, nitrogen dioxide and sulphur dioxide evolved may dissolve in rain water forming nitric acid & sulphuric acid which causes acid rain.
3. **River water —** It is one of the impure forms of natural water since most forms of surface water enters into river water. It contains impurities such as sand partides, organic matter, bacteria, mineral salts which dissolve after soil erosion & dissolved gases.
4. **Lake water —** It is another impure form of natural water which also contains impurities and other soluble salts.
5. **Sea water —** The most impure form of natural water containing over 3% soluble salts including sodium chloride. It also contains salts of calcium & magnesium.

(b) Sources of Water below the earth's surface are —

1. **Well water —** Above the impervious rocky layers, of the earth's surface is well water. which contains soluble impurities.
2. **Spring water —** Natural water accumulated above the rocky layers of the earth which forcefully comes out under pressure from the earth's surface is spring water & contains soluble salts & minerals.

Question 2.
Give the importance of water in

(a) life processes
(b) household purpose
(c) fire fighting
(d) transportation.

Answer:
The importance of the Water is as follows :

(a) Life processes — Water is used by all plants, animals & humans for carrying out various metabolic processes including photosynthesis by plants & excretion by animals & humans.
(b) Household purposes — Water finds numerous applications, such as watering plants, washing clothes, cooking, bathing, cleaning etc.
(c) Fire fighting — Water is used for extinguishing fires either directly or as a constituent in a fire extinguisher.
(d) Transportation — Water serves as a habitat for marine life i.e. preferred place for an organism to live.

Question 3.
Explain how water plays an important role in

(a) industry
(b) agriculture.

Answer:
(a) Uses of Water in Industry :

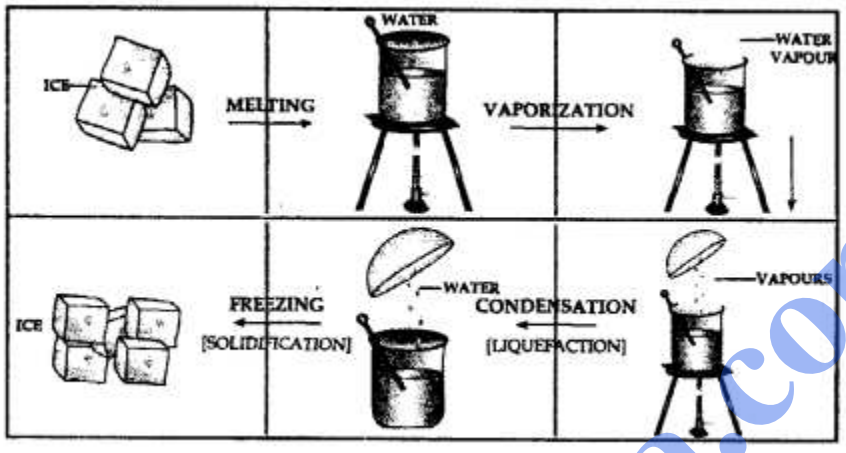
1. Water generates electricity in hydroelectric power stations.
2. Water generates steam in boilers, used for various industrial purposes.
3. Water finds application in chemical & other industries for cooling & cleaning operations.

(b) Uses of Water in Agriculture :
In agriculture water finds importance in irrigation, production of crops & as a medium for spraying pesticides.

Question 4.
Give the occurrence of water in the three different states i.e. solid, liquid and gaseous.
Answer:
The Occurrence of water in three different states are:

1. **Solid state —** As snow and frost.
2. **Liquid state —** In sea water, river water and lake water.
3. **Gaseous state —** As water vapour in air the amount depending on climatic conditions.

Question 5.
Draw a labelled diagram to show the change of state of water from solid state to liquid state to gaseous state starting from ice.
Answer:



Question 6.
Explain the term water cycle. State the main points to show how water moves from the earth's surface to the atmosphere and back to the earth's surface as rain.
Answer:
The 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.
The Process of water cycle is discussed below :
FROM THE EARTH'S SURFACE – TO THE ATMOSPHERE

1. **Evaporation —** The sun's rays fall on the earth & warm its surface & the air above it.
   The heat evaporates the water from the streams, rivers & the sea.
2. **Water** [mainly in the form of water vapour] is also added to the atmosphere by —

(a) Respiration by living organisims
Glucose + Oxygen → carbon dioxide + water + energy
(b) Burning of fossil fuels —

$$\text{Fuel + oxygen} \xrightarrow{\text{heat}} \text{carbon dioxide + water + energy}$$

(3) Formation of clouds — The water vapour along with the warm air rises upwards, where at higher altitudes it condenses into small droplets of water forming clouds.
BACK TO THE EARTH'S SURFACE – AS RAIN WATER

1. **Formation of rain —** The clouds float in the atmosphere & when the size of the water droplets increases they fall down on the earth as rain water.
2. **Rain water falls into streams —** The rain water is absorbed by the soil collects underground & flows into streams.
3. **Stream water enters rivers & seas —** The stream water finds its outlets into rivers & later enters into the seas & oceans.
4. **River & sea water evaporates forming clouds** and thus continuing the water cycle.

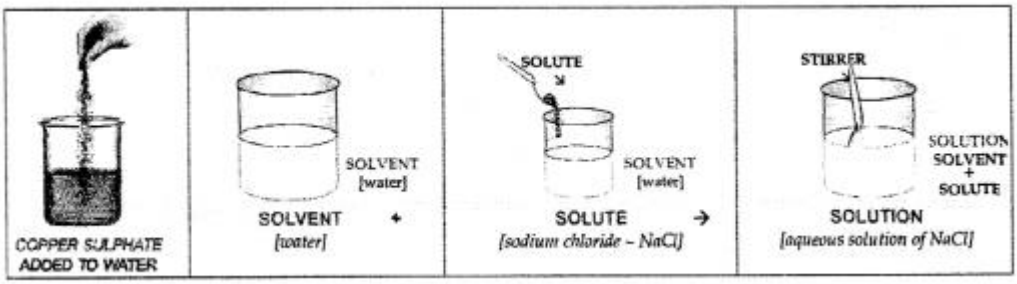
Question 7.
Give a reason why water is considered a universal solvent.
Answer:
Water is a polar covalent compound. When it comes in contact with any substance it breaks the electrostatic forces holding the molecules of that substance. Thus, the molecules break loose from the substance and hence dissolve in water. Thus, water is called a universal solvent and an alkali is not.

Question 8.
Define the term –

(a) solute
(b) solvent
(c) solution with reference to addition of sodium chloride to water.

Answer:
Solute— The substance which dissolves or disappears in the solvent i.e. liquid to form a solution is called a solute. e.g. sodium chloride. .
Solvent— The liquid or medium of dissolution which allows the solute to dissolve in it, so as to form a solution is called a solvent, e.g. water.
Solution— A homogenous mixture of a solute in a solvent is called a solution.

Question 9.
Draw a neat labelled diagram of addition of copper sulphate to water. Labt. solute, solvent and solution in the same.
Answer:



Question 10.
From the following substances given below state which will form a solution in the same.

(a) sodium carbonate
(b) calcium carbonate
(c) charcoal powder
(d) sodium sulphate
(e) table salt
(f) powdered particles of lead from a lead pencil
(g) iron powder
(h) copper filings
(i) sand particles
(j) honey

Answer:

(a) sodium carbonate
(d) sodium sulphate
(e) table salt
(j) honey

Question 11.
Name two gases each

(a) which are soluble in water
(b) which are insoluble in water.

Answer:

(a) The gases which are soluble in water are Carbon dioxide and chlorine
(b) The gases which are not soluble in water are Nitrogen, hydrogen

Question 12.
If 'X' g. of potassium nitrate is added to 100 g. of water at 60°C and the salt dissolves completely then —

(a) is 'X' g. the solubility of potassium nitrate at 60°C.
(b) is the solution formed – saturated or unsaturated
(c) if on addition 'X' + 'Y' g. of potassium nitrate to the same amount of water at the same temperature and the solute now just remains behind after stirring then –
(d) is the solution now – saturated or unsaturated
(e) is 'X' + 'Y' g. the solubility of potassium nitrate.

Answer:
Add 'X' g. of solute i.e. potassium nitrate to 100 g. of water 60°C.

1. Stir the solute i.e. potassium nitrate in water thoroughly.
2. 'X' g. of the solute completely dissolves in water.
3. Add more solute and again stir thoroughly.
4. The solute continues to dissolves.
5. Water i.e. the solvent can dissolve more of the solute at the given temperature.
6. The solution is therefore is said to be unsaturated.

Add more solute to water till on adding an amount 'X + Y' g. of the solute i.e. potassium nitrate to 100 g. of water at 60°C.

1. The solute just remains behind after stirring.
2. The solution is now saturated.

A saturated solution cannot dissolve more of the solute at a given temperature.

Question 13.
State whether the following statements are **true or false.** If false write the correct statement.
Answer:

(a) Solubility of most solids – decrease with increase in temperature.
Answer. False.
Correct — Solubility of most solids – increase in temperature.
(b) Distilled water is potable water.
Answer. False.
Correct — Drinking water is potable water.
(c) The process to remove germs in water is also called sterilization.
Answer. True.

Question 14.
Differentiate between chemical pollution and thermal pollution.
Answer:

(a) Chemical pollution — A large number of industrial chemicals which include chemicals from paint, textile & dyestuff industry & various acids & salt solutions enter into water when discharged as industrial wastes.
Chemical pollutants include — Metallic salt solutions of mercury & lead which cause heavy devastation of marine & plant life.
Agricultural wastes include — Poisonous pesticides namely fungicides & insecticides which may also enter underground water through the soil.
(b) Thermal pollution — Certain industries such as the iron & steel industry & numerous chemical plants use large amounts of water for varied functions.
The discharged waste water after going through technical processes – is rendered hot & on entering streams of natural water – enhance growth of harmful biological organisms.

Question 15.
State some important steps to avoid pollution of water.
Answer:
Steps to avoid pollution of water are :

(a) Harmful wastes such as oils & chemicals should not enter into the water.
(b) Proper toilets & sewage systems should be used to prevent human excreta, containing disease causing organisms to enter into the water.
(c) Washing of clothes & bathing should be avoided near water sources.
(d) Planting of trees near water sources including river banks also minimizes pollution.
(e) To minimize thermal pollution the water should be cooled before being discharged as a waste.
(f) Man should be made aware through various awareness programmes & media about the harmful effects of water pollution & ways to control it.

Question 16.
State what is meant by the term ‘conservation of water’. State a few water saving methods, which may be used in the home to conserve water.
Answer:
Conservation of water is the means of preventing wastage of water so that clean water can be obtained by preventing pollution of water and by protecting the sources of water.
Need for conservation — Inspite of large quantities of water on the earth’s surface only a small percentage is potable water fit for human consumption and household purposes.
The need for water is ever increasing and hence all sources of water need to be conserved.
The various methods to conserve the water are :

1. Well should be covered and washing and cleaning should be prevented near a well.
2. Water saving devices must be used in homes

(a) such as closing running taps and using smaller cisterns in toilets.
(b) checking all leakages in household pipes.
(c) turning off the water tap while brushing teeth and while washing hands.
(d) using less electricity, since power plants also consume substantial amount of water.

Question 17.
Give a reason why :

(a) Conservation of water is essential in spite of the fact that three fourth of the earth's surface is covered by water.
(b) Polluted water causes disease.
(c) Drip irrigation helps in conservation of water.

Answer:

(a) Because only a small percentage is potable water fit for human consumption and household purposes.
(b) Polluted water acts as a carrier for germs which causes various diseases.
(c) Drip irrigation in agriculture utilizes supply of water in small quantities.

Objective Type Questions

Q.I. Complete the statements by filling in the blanks with the correct words.

1. Rain water is the purest form of water. It may dissolve gases like **carbon dioxide** forming weak acids.
2. Water generates **electricity** in hydroelectric power stations and **steam** in boilers for industrial applications.
3. Water is added to the atmosphere by **burning of fossil fuels** and **respiration by living organisms.**
4. If potassium nitrate is added to water in a beaker to give a homogeneous mixture, then potassium nitrate is referred to as the **solute,** water as the **solvent** and the homogeneous mixture as the **solution**.
5. Water fit for human consumption and drinking purposes is called **potable water.**

Q.2. State whether the following statements are true or false. If false, write the correct statement.

1. Sea water contains salts of calcium and magnesium.
Answer. True.

2. Water finds application as a means of transporting goods.
Answer. True.

3. On boiling water exists in the liquid state.
Answer. False.
Correct — On boiling water exists in the gaseous state.

4. Respiration uses up water from the atmosphere.
Answer. False.
Correct — Respiration add up water to the atmosphere.

5. Well water exists below the impervious rocky layers of earth.
Answer. False.
Correct — Well water exists above the impervious rocky layers of earth.

6. Sodium carbonate and sodium sulphate do not form an aqueous solution.
Answer. False.
Correct — Sodium carbonate and sodium sulphate form an aqueous solution.

7. If 'X' g. of solute is added to 100 g. of water at t°C and the solution formed is a saturated solution, then 'X' g. is the solubility of the solute.
Answer. True.

8. Purification of water is carried out to remove – dissolved gases e.g. carbon dioxide and dissolved minerals like magnesium salts.
Answer. True.

9. Water from rivers and lakes is – potable water.
Answer. False.
Correct — Water from rivers and lakes is impure water.

10. Chemical pollutants include metallic salt solution of mercury and lead.
Answer. True.

Q.3. Match the statements in List I, 1-10 with their correct answer in List II, A to J.

List I	List II
1. Sodium carbonate and water	A : Sea water
2. Chemical used in sedimentation during purification of water	B : Preferred place for an organism
3. Vapourisation	C : Liquid state
4. Kerosene and water	D : Aqueous solution
5. A solution which can dissolve more of solute at a given temperature	E : Dissolved gases and minerals
6. Water as a habitat for marine life	F : Unsaturated solution
7. A water-borne disease	G : Immiscible mixture
8. Existence of water between 0°C and 100°C	H : Liquid to gaseous state
9. Taste in water is due to	I : Dysentery
10. The most impure form of water	J : Alum

Ans.

List I	List II
1. Sodium carbonate and water	D : Aqueous solution
2. Chemical used in sedimentation during purification of water	J : Alum
3. Vapourisation	H : Liquid to gaseous state
4. Kerosene and water	G : Immiscible solution
5. A solution which can dissolve more of solute at a given temperature	F : Unsaturated solution

6. Water as a habitat for marine life	B : Preferred place for an organism
7. A water-borne disease	I : Dysentery
8. Existence of water between 0°C and 100°C	C : Liquid state
9. Taste in water is due to	E : Dissolved gases and minerals
10. The most impure form of water	A : Sea water

Q.4. Explain the meaning of the following terms :

1. Rain water harvesting
2. Drip irrigation in agriculture
3. Saturated solution
4. Conservation of water
5. Gaseous state of water in air

Answer:

1. **Rain water harvesting** which is a means of utilizing rain water instead of allowing it to be wasted to be conducted by building tanks or pits in low lying areas and collecting roof top rain water through pipes into tanks.
2. **Drip irrigation in agriculture** utilizes supply of water in small quantities.
3. **A saturated solution** cannot dissolve more of the solute at a given temperature.
4. **Conservation of water** is the means of preventing wastage of water so that clean water can be obtained by preventing pollution of water and by protecting the sources of water. Polluted water acts as a carrier for germs which causes various diseases.
5. **Gaseous state of water in air :** Gaseous State as water vapour in air the amount depending on climatic conditions.

Q.5. Name the following

Question 1.
A chemical used during chlorination of water.
Answer:
Chlorine.

Question 2.
An agricultural pollutant in water.

Answer:
Insecticides.

Question 3.
A solid, ‘natural form of water.
Answer:
Snow.

Question 4.
The natural process by which circulation of water takes place from earth’s surface to atmosphere and back to earth’s surface.
Answer:
Water cycle.

Question 5.
The liquid or medium of dissolution which allows the solute to dissolve in it.
Answer:
Water (solvent).