Matter

POINTS TO REMEMBER

1. Horse, mango tree, dog, animals, plants are living, while stone, pen, glass, water, book, table, air are non-living.
2. All the above mentioned things living and non-living are matter.
3. Energies like light, sound, heat are not matter, as these have no mass.
4. **Matter** : “Anything that has mass and occupies space is called matter.” Matter (mass) remains same at all places.
5. Molecules of matter are in motion.
6. The things which are similar in one or more ways are grouped together and this practice is classification.
7. There are inter-molecular gaps (spaces) and inter-molecular attraction (force of attraction) between molecules.
8. Solids are rigid, have definite volume, retain their shape and are incompressible.
9. Liquids can flow, have definite vol., have no definite shape. Have only one free surface.
10. Gases Have no definite volume, no definite shape can flow are compressible.
11. Inter-molecular force : Solids > Liquids > Gases.
12. Inter-molecular volume : Solids < Liquids < Gases.

Activity 1

Question 1.
List five substances made using each of the following materials:
Answer:

1. **Wood :** Chair
2. **Paper :** Book
3. **Plastic :** Bucket
4. **Metals :** Copper wire
5. **Leather :** Shoes
6. **Cloth :** Shirt or bag

EXERCISE- I

Question 1.
Define matter.
Answer:
Anything that has mass and occupies space is called matter.

Question 2.
What are the two main types of matter? Give two examples for each type.
Answer:
The two main types of matter are :

1. **Living matter:** The earth is home to all kinds of plants and animals. They can grow, move and reproduce on their own. Examples : Plant, lotus, animals, human etc.
2. **Non-living matter :** Most of the matter in the universe is non-living. It means that it does not grow, move or reproduce on its own. It can be natural or man made.

(a) Natural matter: It occurs in nature and can be used to make more useful substances, e.g., wood, coal, silk, water, stone, cotton, jute, cereals, fruits, etc.
(b) Man-made matter : It is produce artificially from natural matter, e.g., plastics, soaps, detergents, medicines, glass, nylon, steel, ceramic, etc.

Question 3.
Differentiate between living and non-living matter.
Answer:
Living matter:

1. The earth is home to all kinds of plants and animals. They can grow, move and reproduce on their own.
2. It is natural only.

Non-living matter:

1. Most of the matter in the universe is non-living. It means that it does not grow, move or reproduce on its own.
2. It can be natural or man made.

Question 4.
Select natural and man made matter from the following list: Wood, plastic, silk, medicines, detergents, coal, water, ceramic, cotton, glass, nylon, fruits.

Answer:
Natural matter: Wood, silk, coal, water, fruits.
Man made matter: Plastic, medicines, detergents, ceramic, cotton, glass, nylon.

EXERCISE-II

Question 1.
Name the smallest particle from which matter is made up.
Answer:
The smallest particle from which matter is made up is atom.

Question 2.
What are molecules?

Answer:
Molecules are the smallest unit of matter. They exhibit all the properties of that kind of matter and is capable of independent existence.

Question 3.
Give one difference between atoms and molecules.
Answer:
Atoms may or may not have independent existance. While molecules have independent existence.

Question 4.
Define:
(a) Intermodular force of attraction.
(b) Intermodular space.

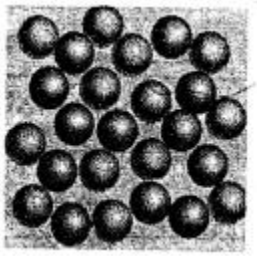
Answer:
(a) The molecules of matter are always in motion and attract each other with a force, and this force is called intermodular force of attraction due to which they are held together.
(b) The molecules can move only when there are gaps or space between them, this space is called intermodular space.

Question 5.
Name the three states of matter and define them.
Answer:
The three states of matter are :

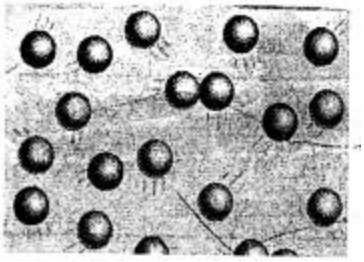
1. **Solid State**
2. **Liquids**
3. **Gases :**

Solid State : The molecules are very close to each other hence intermodular spaces are small and intermodular force is strong.

Hence solids have definite volume, rigid, retain definite shape and are incompressible.
Liquids : The molecules are less closely packed have more intermolecular spaces than solid, less stronger forces than solids.



Hence liquids have definite volume but no definite shape. They take the shape of container in which they are put.



Gases : The molecules in the gases are far apart with weakest force of attraction. Hence gases have neither definite volume nor definite shape but easily compressible.

Question 6.

What are fluids ? Give two examples

Answer:

Substances that can flow are called fluids. Both gases and liquids are fluids, e.g. gases (carbon dioxide, hydrogen), liquids (water, petrol and sulphuric acid).

Question 7.

Classify the following into solids, liquids and gases.
Oxygen, milk, common salt, wax, stone, L.P.G, carbon- dioxide, sugar, mercury, coal, blood, butter, copper, coconut oil, kerosene.

Answer:

Solids	Liquids	Gases
Common salt	Milk	Oxygen
Wax	Mercury	L.P.G.
Stone	Blood	Carbon dioxide
Sugar	Coconut oil	
Coal	Kerosene	
Butter		
Copper		

Question 8.

Give reasons

(a) Liquids and gases flow but solids do not ?
(b) A gas Alls up the space available to it.
(c) The odour of scent spreads in a room.
(d) We can walk through air.
(e) Liquids have definite volume but no definite shape.
(f) When a teaspoon of sugar is added to half a glass of water and stirred, the water level in the glass remains unchanged.
(g) When an empty gas jar is inverted over a gas jar containing a coloured gas, the gas also spreads into the empty jar.
(h) A red ink drop added to small amount of water in a glass turns the water red in some time.

Answer:
(a) The molecules of liquids and gases are far apart i.e. have more gaps, intermolecular attraction force is very less as compared to solids, hence liquids and gases can flow but solids do not as gaps*in solid molecules is less and molecular force of attraction very strong.
(b) Intermolecular force of attraction is least and intermolecular spaces are very large, hence gases can fill up the space available to them.
(c) Scent fumes (molecules) being gases fill the spaces between air molecules and the molecules of air fill the spaces between scent molecules due to diffusion, fumes spread into a room.
OR
Due to inter-mixing of scent molecules and air molecules, scent fumes spread into the room.
(d) The molecules of air are far apart i.e. large gaps and we can walk through air easily.
(e) The molecules of liquid are loosely packed and intermolecular force of attraction is small but number of molecules in it remain the same. Hence liquids have definite volume but no definite shape.
(f) When a teaspoon of sugar is added to half a glass of water and stirred, the water level in the glass remains unchanged because the sugar particles are adjusted between the water molecules as inter-molecular gaps are more in liquids.
(g) This is because Gases can diffuse or flow in all directions.
(h) When we put a drop of red ink in a glass of water, its particles diffuse with particles of water slowly but continuously and the water turns red.

Question 9.
Define:
(a) cohesive force
(b) diffusion
(c) Brownian movement

Answer:
(a) Cohesive force : The force of attraction between particles of the same substance is called cohesive force.

(b) Diffusion: The phenomenon of intermixing of particles of one kind with another kind is called diffusion.
(c) Brownian movement: The zig-zag motion of particles suspended in a medium is called Brownian movement

Question 10.
Why is an egg kicked out of a bottle when air is blown inside the bottle?
Answer:
When we invert the bottle and blow air into the bottle throw the side opening. It creates high pressure inside the bottles and the egg is kicked out of the bottle.

EXERCISE-III

Question 1.
State the three effects of heat on matter.
Answer:
When a substance is heated, it can cause.

1. Interconversion of states of matter.
2. Thermal expansion of the substance.
3. Chemical change.

Question 2.
(a) Define : interconversion of states of matter.
(b) What are the two conditions for the interconversion of states of matter ?

Answer:
(a) The process by which matter changes from one state to another and back to original state, without any change in its chemical composition.
(b) Two conditions are :

1. Change in temperature
2. By applying pressure

Question 3.
Define the following terms:
(a) Fusion
(b) Vaporisation
(c) Condensation
(d) Sublimation
(e) Diffusion
(f) Melting point
(g) Boiling point
(h) Liquefaction

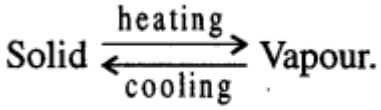
Answer:

(a) Fusion : The heating process by which a solid changes into the liquid state is called fusion.

(b) Vaporisation : The heating process by which a liquid changes into its vapour state is called vaporisation.

(c) Condensation : The process by which a substance in gaseous state changes into its liquid state is called condensation.

(d) Sublimation: The change of solid on heating to vapours directly and vice-versa without passing through the liquid state is called sublimation.



(e) Diffusion : The phenomenon of intermixing or spreading of gaseous molecules is called diffusion.

(f) Melting point: The fixed temperature at which a solid changes into a liquid at a given pressure is called its melting point. The temperature remains constant as long as the conversion is going on.

(g) Boiling point: The fixed temperature at which a liquid starts changing into gaseous state is called its boiling point. The temperature remains constant till the whole of the liquid changes into gaseous state.

(h) Liquefaction : Change of vapours on cooling to liquid is called liquefaction.

Question 4.

Differentiate between:

(a) Solidification and condensation

(b) Melting and boiling

(c) Gas and vapour

(d) Miscible and immiscible liquids.

Answer:

(a) Solidification : The process of changing liquid into a solid state by cooling is known as solidification.

Example : water → ice.

Condensation : The process of changing a gas or vapour state to a liquid state by cooling is known as condensation. Example : steam → water.

(b) Melting : The fixed temperature at which a solid changes into a liquid at a given pressure is called its melting point.

e.g. ice → water.

Boiling : The fixed temperature at which a liquid starts changing into gaseous state is called its boiling point.

e.g. water → steam.

(c) Vapourisation : The process by which a substance changes from a liquid state to vapour state is called vaporisation or evaporation.

e.g., Water changes into gaseous state on heating.

Gas : The substance which remain in the gaseous state under normal conditions of

temperature and pressure are called gases.
e.g, Oxygen, hydrogen, nitrogen.
(d) Miscible: Liquids which mix with each other are called miscible liquids. Example : Water and alcohol.
Immiscible liquids : Liquids which do not mix with each other are called immiscible liquids. Example Water and oil.

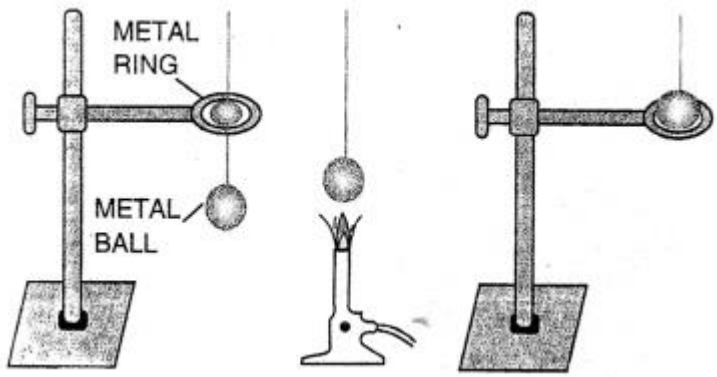
Question 5.
Give reasons :
(a) How is interconversion of states of matter different from chemical reaction ?
(b) Why a solid does not flow, but a liquid flows ?
Answer:
(a) During interconversion of state of matter composition
of substance remains the same matter changes from one state to another and back to the original state, while chemical reaction involves re-arrangement of the molecular structure and composition changes.
(b) In solids there is a strong force of attraction between the molecules and the space between them is very negligible. The molecules are therefore, not free to move. They merely vibrate about their mean positions. But in the case of liquids, the molecules are not very closely packed. They do not attract each other as strongly as the molecules of solids. Thus, the intermolecular spaces are larger and the molecules are able to move about more freely. This makes a liquid flow.

Question 6.
How does a liquid changes into its gaseous state? Explain ?
Answer:
As a liquid is heated, its particles starts gaining energy and move more vigorously which increases the gaps between the particles and decreasing the force of attraction. Ultimately a liquid changes into gaseous state.

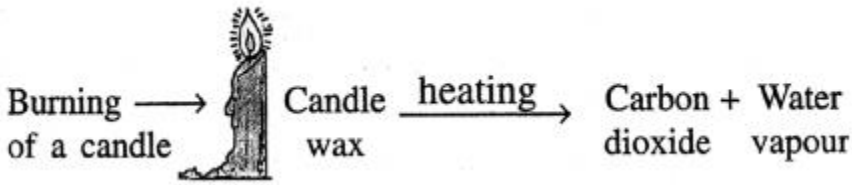
Question 7.
Water cycle is an example of interconversion of states of water. Explain.
Answer:
Water from oceans, rivers, lakes from leaves of trees (transpiration) changes into vapours when temperature increases or evaporates and enters the atomsphere as clouds when temperature falls the vapours change into water and some of it in the form of snow fall on mountains and earth in the form of water and hales and this continues. Thus water cycle is example of interconvertion of states of water.

Question 8.
What happens to a metal ball when it is heated? What does this show?
Answer:
When metal ball is heated, it expands. This can be proved by following experiment: Take a metallic ring and ball. Try to pass the metal ball through the ring. The ball is able to pass through the ring. Now heat the metal ball for 5-6 minutes. The hot ball is not be

able to pass through the ring.
This shows that a solid expands on heating. Now cool the ball, it again passes through the ring. This shows that a solid contacts on cooling.



Question 9.
Why does a candle become smaller on burning with time?
Answer:
On heating, candle wax melts, then turns into vapour which reacts with air to produce two new substances, carbondioxide and water.



Therefore a candle on burning becomes smaller and smaller and the part of wax which has undergone chemical change cannot be recovered.

OBJECTIVE TYPE QUESTIONS

Question 1.
Fill in the blanks :

(a) Water is a matter because it has **mass** and occupies **space.**
(b) Any matter which has a definite **volume** but no definite shape is called a **liquid.**
(c) Liquids and **gases** can flow.
(d) The molecules are at a greater distance in **gases** compared to liquids.
(e) Water boils at 1**00 °C.**
(f) The physical state of a substance, which has neither fixed volume nor fixed shape is a **gas.**

Question 2.
Write whether the following statements are true or false.

(a) Only water can exist in three different states.
(b) If the container in which a gas is collected has an opening, the gas will flow out and spread itself indefinitely.
(c) Solids have the larg^* inter-molecular space.
(d) There is no difference between evaporation and boiling.
(e) All solids, on heating, first change to the liquid and then to the gaseous state always.
(f) The intermolecular force of attraction is the weakest in gases.
(g) A gas has no free surface.

Answer:
(a) True
(b) True
(c) False
Correct: Solids have the very small (negligible) inter-molecular space.
(d) False
Correct : There is a difference between evaporation and boiling.
(e) False
Correct : Few solids, on heating, first change to the liquid and then to the gaseous state always.
(f) True
(g) True

Question 3.
For each of the following statements, say whether it describes a solid, a liquid or a gas.

(a) Particles move about very quickly but do not leave the surface : **Liquid**
(b) Particles are quite close together : **Solid**
(c) Particles are far apart and move in all directions : **Gas**

Question 4.

Match the following :

	Column A		Column B
(a)	**Solids**	***(i)***	**Can flow in all directions.**
(b)	**Sublimation**	***(ii)***	**The temperature at which a liquid changes into its gaseous state.**
(c)	**Boiling point**	***(iii)***	**Can have any number of free surfaces.**
(d)	**Gases**	***(iv)***	**Gaps between particles.**
(e)	**Intermolecular space**	***(v)***	**Change of state from solid to gas.**

Ans.

	Column A		Column B
(a)	Solids	(iii)	Can have any number of free surfaces.
(b)	Sublimation	(v)	Change of state from solid to gas.
(c)	Boiling point	(ii)	The temperature at which a liquid changes into its gaseous state.
(d)	Gases	(i)	Can flow in all directions.
(e)	Intermolecular space	(iv)	Gaps between particles.

Question 5.

Name the phenomenon which causes the following changes:

(a) Formation of water vapour from water.

(b) Disappearance of camphor when exposed to air.

(c) Conversion of ice into water.

(d) Conversion of water into steam.

Answer:

(a) Formation of water vapour from water is **vaporisation.**

(b) Disappearance of camphor is **sublimation.**

(c) Conversion of ice into water is **melting.**

(d) Conversion of water into steam is **boiling.**

Question 6.

Give two examples for each of the following :

(a) Substances which sublime.

(b) Substances which do not change their states.

(c) Substances which are rigid and not compressible.

Answer:
(a) Naphthalene, camphor, dry ice.
(b) Oxygen, hydrogen, nitrogen
(c) Glass, stone, pen.

MULTIPLE CHOICE QUESTIONS

1. Which one is a kind of matter :
(a) light
(b) petroleum
(c) sound
(d) heat

2. the state of matter which has no definite shape or volume is called
(a) solid
(b) liquid
(c) gas
(d) water

3. There are large intermolecular gaps in
(a) water
(b) iron ball
(c) common salt ..
(d) air

4. All kinds of matter
(a) occupy space and have a definite mass
(b) have mass and a definite shape
(c) can change their states
(d) have a definite volume

5. A kind of matter which can sublime is
(a) water
(b) plastic
(c) milk
(d) iodine

6. A substance which can change its state
(a) wood
(b) oxygen
(c) paper
(d) cloth

7. The process by which a solid changes into a liquid is called
(a) freezing
(b) melting
(c) condensation
(d) evaporation

PROJECT

Question 1.
Fill the following chart showing twelve solids, twelve liquids, four gases and eight materials.
Answer:
Solids : (1) Mobile. (2) Pen. (3) Pair of shoes. (4) A T.V. set (5) Chair. (6) Telephone. (7) Remote control. (8) Wood. (9) Ornaments. (10) Scissors. (11) Eraser. (12) Mirror.
Liquids : (1) Ink. (2) Water. (3) Lemon juice. (4) Cough syrup. (5) Mouth wash. (6) Petrol. (7) Kerosene oil. (8) Spirit. (9) Thinner. (10) Mercury. (11) Milk. (12) Copper sulphate solution.
Gases : (1) Hydrogen. (2) Oxygen. (3) Sulphur dioxide. (4) Chlorine gas.
Materials : (1) Paper. (2) Wood. (3) Iron nails. (4) Cement. (5) Tiles. (6) Plaster of paris. (6) Sand. (7) Iron rods. (8) Bricks.

Question 2.
Think and try to find a way to demonstrate water cycle in class.
Answer:
Do it yourself.

Question 3.
To identify materials of common use
Procedure – Just move around in your house – in the drawing room, sitting room, bedroom, kitchen, bathroom etc.
Identify the things and All in the blanks in the table given below:

- Study room
- Drawing room
- Kitchen
- bathroom
- another place

S.No. Place	Name of the thing	Material used for making the thing
Study room Drawing room Kitchen bathroom Any other place		

Answer:

S.No. Place	Name of the thing	Material used for making the thing
1. Study room	Table, chair, books pens, pencils, table lamp, computer, fan	Wood, plastic, paper, glass, bakelite, connecting wires made of metal and plastics
2. Drawing room	Sofa, table, chairs, fan, curtains, windows etc.	Wood, cloth, coir, paint, plastics, aluminium, glass etc.
3. Kitchen	Taps, wash basin, cupboards, utencils, heating vessels strainer, containers aqua pure etc.	Steel, aluminium, glass, china clay, iron, plastic, copper, stainless steel, brass etc.
4. Bathroom	Taps, tubs, mugs, tooth brush, tooth paste, soap, pail etc.	Iron, brass, stainless steel, plastics etc.
5. Any other place	Scooter, car, road, rooms, trucks, shops.	Iron, rubber, coaltar, bricks, wood, plastics, clothes.

ADDITIONAL QUESTIONS FOR PRACTICE

Exercise

Question 1.

Explain the term 'matter'. One kind of matter can be distinguished from another by its physical properties and chemical properties. State the main physical properties of matter.

Answer:

Matter is the basic substance of which all materials are made of

Physical Properties— They are those properties which include state, colour, odour, density etc.

Chemical Properties— They are properties which include reactions of different

materials with different chemical.
Physical Properties of Matter are :

Colour : All matter an be distinguished by their varied- colours.

Odour : Matter shows variation in odour or smell.

Solubility : Matter may vary in solubulity in water or other solvents.

Melting & Boiling Points : Substances variation in their melting and boiling points.

Question 2.
The three main states of matter are solids, liquids and gases. Compare the three states with reference to the following characteristics of matter
(a) volume
(b) shape
(c) compressibility
(d) diffusion.

Answer:

Characteristics	Solids	Liquids	Gases
* Volume	Have a definite volume	Have a definite volume	Have no definite volume
* Shape	Have a definite shape	Have no definite shape	Have no definite shape
* Compressibility	Cannot be compressed	Slightly compressible	Highly compressible
* Diffusion [Intermingling of Molecules]	Cannot diffuse	Shows diffusion	Diffuses very easily

Question 3.
Matter in any state is composed of particles. Compare the three states of matter Le. solids, liquids and gases with reference to :
(a) intermolecular space
(b) intermolecular force of attraction

(c) movement of particles

Answer:

Characteristics	Solids	Liquids	Gases
* **Intermolecular space**	Minimum space	More than solids	Maximum space
* **Intermolecular Force of attraction**	Very strong	Less strong	Very weak
* Movement of particles	About their own position	In continuous motion	In any random direction

Question 4.

Describe simple experiments to prove that – solids

(a) occupy space

(b) have mass

(c) have a definite volume

Answer:

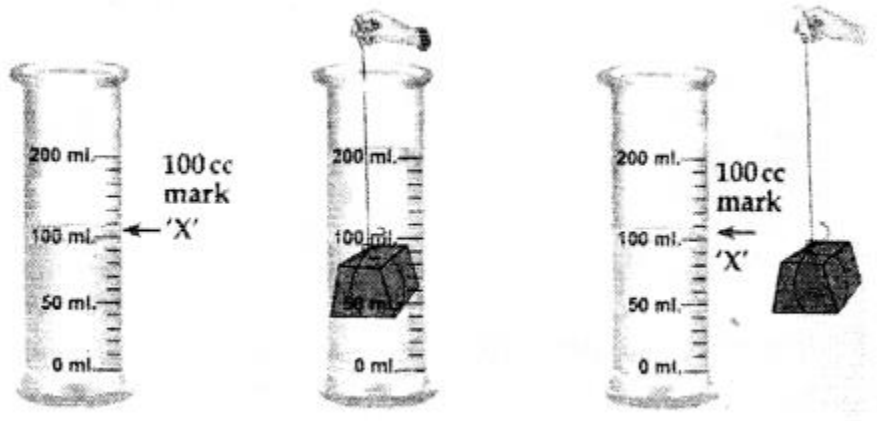
(a) occupy space : solid-occupies space

'A'-A measuring cylinder is filled with water to a particular mark- 'A'.

'B'-A piece of wooden block- is immersed inside the measuring cylinder. The water level rises up. .

'C'-On removal of the block- the water level in the measuring cylinder falls down back to the mark- 'A'

Conclusion : The block pushes the water out and occupies its space, hence all solids occupy space.

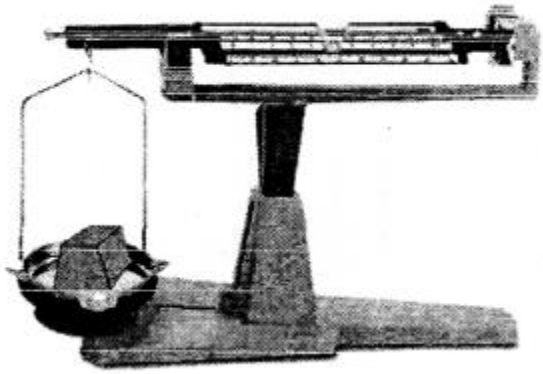


(b) Have mass – A solid has mass

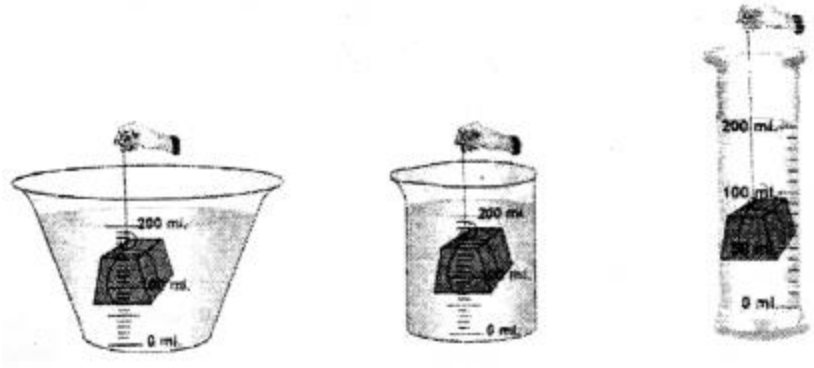
A : A simple scale – is taken, as shown below

B : A solid is placed – on one side of the scale, causes the scale tilts towards one side.

Conclusion – The scale tilts due to the mass of the solid, hence all solids have mass.

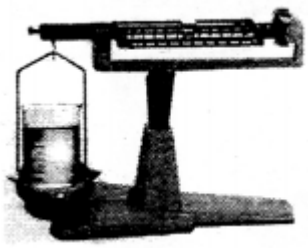


(c) Have a definite volume : A solid placed in any container filled with water displace the same amount of water.
Conclusion : Solid displace water and retain their own volume, hence all solids have a definite volume.



Question 5.
Describe simple experiments to prove that – liquids
(a) have mass
(b) have a definite volume
(c) have no definite shape

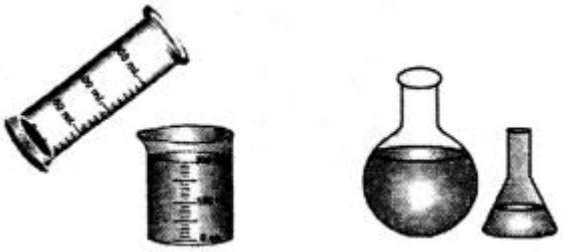
Answer:
(a) have mass a liquid occupies mass
Experiment : A liquid placed on one side of the scale, causes the scale to tilt towards one side.
Conclusion : The scale tilts due to the mass of the liquid, hence all liquids have mass.



(b) have a definite volume

Experiment : A liquid in a measuring cylinder can be poured into any container. The volume of liquid in the container, is the same as that in the measuring cylinder.
Observation : The volume of liquid in the container, is the same as that in the measuring cylinder. Hence, all liquids have a definite volume.

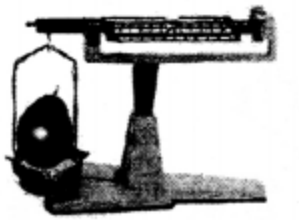
(c) have no definite shape
Experiment : A liquid poured into any container takes up the shape of each container.
Conclusion : All liquids have no definite shape.



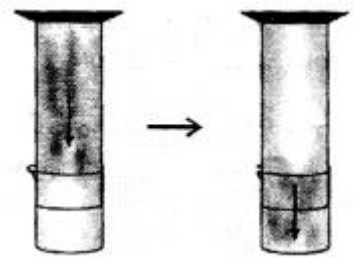
Question 6.
Describe simple experiments to prove that – gases
(a) occupy space
(b) have mass
(c) have no definite volume or shape

Answer:
(a) occupy space
Experiment
'A' – A glass beaker or bowl is half filled with water.
'B' – An empty glass tumbler [which of course contains air] is inverted an lowered inside it.
'C' – On tilting the tumbler, air is displaced and bubbles are seen coming out.
Conclusion : Air or gases occupy space.

(b) Have mass
Experiment
An inflated balloon placed on one side of the scale causes it to tilt towards one side.
Conclusion : The scale tilts due to the mass of the gas, hence all gases have mass.

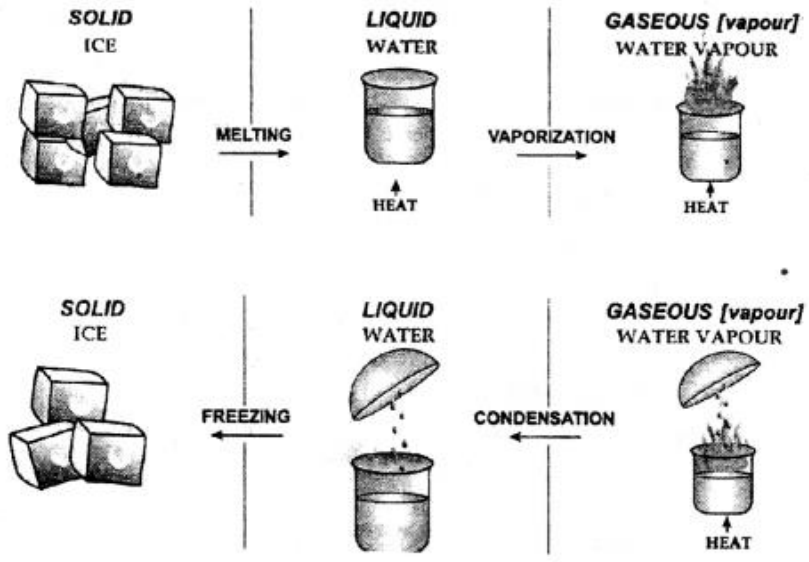


(c) Have no definite volume or shape
Experiment
A gas takes up the volume of any enclosed space filling it up completely.
Conclusion : Gases take up any volume and hence all gases have no definite volume.



Question 7.
Explain the term 'Intercon version of matter'. With reference to ice, water and water vapour show diagrammatically the change of state of matter from solid to liquid to gaseous and back to original state.

Answer:
INTERCONVERSION OF MATTER :
"Change of state of matter from one state to another state and back to its original state is called inter-conversion of matter." The diagram showing the Change of State of Matter :



(a) ICE TO WATER (MELTING) : Conversion of a solid into a liquid on heating e.g. ice to water.
(b) WATER TO WATER VAPOUR (VAPORISATION): Conversion of a – liquid into vapours (or gas) on heating e.g. water to water vapour.
(c) WATER VAPOUR TO WATER (LIQUEFACTION or CONDENSATION) : Conversion of VAPOUR (or gas) into a LIQUID on cooling e.g. water vapour to water.
(d) WATER TO ICE (SOLIDIFICATION OR FREEZING) : Conversion of a LIQUID into a SOLID e.g. water to ice.

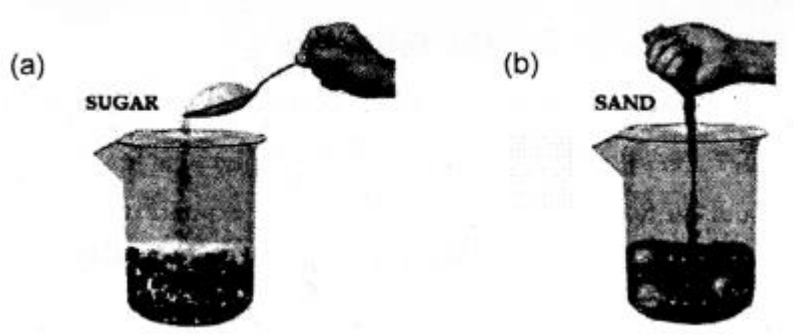
Question 8.
Explain the terms

(a) melting
(b) vaporization
(c) condensation
(d) freezing
(e) melting point
(f) boiling point.

Answer:
Matter can change from solid to liquid to gaseous state and back to solid state. This is called change of state of matter.
(a) Melting— The process of conversion of a solid into liquid on heating.
e.g. Ice to water.
(b) Vaporization— The process of conversion of a liquid into vapour on heating.
e.g. Water to water vapour.
(c) Condensation— The process of conversion of vapour into a liquid.
e.g. Water vapour to water.
(d) Freezing— The process of conversion of a liquid into a solid.

e.g. Water to ice.
(e) Melting point— The constant temperature at which a solid melts into a liquid.
M.P. of ice – 0°C.
(f) Boiling point— The constant temperature at which a liquid starts boiling.
B.P. of water – 100°C.

Question 9.
State what would you observe if (a) sugar is added to pebbles take in a plastic beaker (b) sand is added to glass balls in a beaker. What would you conclude from this imaginative demonstration.
Answer:
Experiment : Add sugar to pebbles taken in a plastic beaker or sand to glass balls in a beaker.
Observation : The sugar or the sand goes into the space between the pebbles & the glass balls respectively.
Conclusion : An imaginative demonstration to show that intermolecular spaces between particles are occupied easily.



Question 10.
With the help of a simple diagram how would you show that – solids expand on heating
Answer:
Solids expand on heating can be shown by two different experiments. The experiments are :

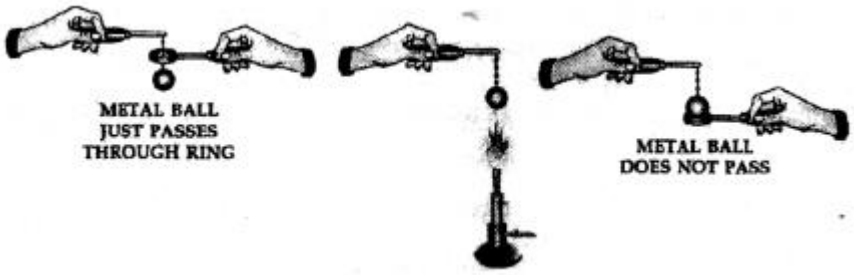
Experiment A : An iron bar is taken and its length measured accurately.
The iron bar is then slowly heated for a certain period of time & measured accurately [with a vernier calipers or otherwise]

Observation : It is observed that the iron bar has increased in length on heating.

Experiment B : A simple ball & ring apparatus is taken, which consists of a metal ball which can just pass through the circular metal ring. The metal ball is then heated for a certain period of time.

Observation : After heating, the metal ball does not pass through the ring, since on heating it has expanded in size and hence cannot pass through the ring.

Conclusion : All solids expand on heating.



Question 11.

Give reasons for the following :

(a) Solids have a definite shape and are highly rigid while gases have to definite shape and are least rigid.

(b) Sugar can be distinguished from talcum powder using water.

(c) Water on freezing turns into ice.

(d) A bottle of perfume on opening evolves an odour which can be sensed over a long distance.

Answer:

(a) Solids have very closely packed atoms with minimum spaces between them while gases have atoms which are for apart with maximum spaces between them. Solids have a definite shape and are highly rigid while gases have no definite shape and are least rigid.

(b) Sugar is soluble in water whereas talcum powder is not.

(c) Every pure substance has a fired melting point or boiling point.

(d) A bottle of perfume on opening evolves an odour because gases diffuse very easily and odour spreads over a large distance.

Question 12.

Complete the statements given below by selecting the correct word/s.

(a) Solids and liquids have a definite but ____ gases do not. [mass, shape, volume]

(b) The space between atoms in is maximum while in ____ is minimum, [solids,

liquids, gases]
(c) Conversation of a vapour into a liquid is called ____ . [vaporization, condensation, freezing]
(d) ____ is an example of a crystalline substance . [wax, sugar, tea]

Answer:
(a) Solids and liquids have a definite **volume** but gases do not.
(b) The space between atoms in **gases** is maximum while in solids is minimum.
(c) Conversation of a vapour into a **liquid** is called condensation.
(d) **Wax, sugar** is an example of a crystalline substance.

Question 13.
State which of the following statements are false. If false write the correct statement.

(a) Solids are highly compressible and rigid.
Ans. True.

(b) Atoms/molecules in gases move only about their own positions.
Ans. False. Atoms/molecules in gases move every where.

(c) The conversion of water to ice is called freezing.
Ans. True.

Objective Type Questions

Question 1.
Fill in the blanks with the correct word/s from the bracket.

1. From the three states of matter, _____ (solids / liquids / gases) expand the least.
2. Brownian movement is maximum in ____ (gases / solids / liquids).
3. Cohesive forces are negligible in ____ (liquids / solids / gases)
4. Matter can change from one state to another by change in ____ [temperature or pressure /temperature only].
5. The space between atoms' [molecules] of solids is ____ [minimum / maximum].
6. Intermingling of molecules is called ____ [perforation / diffusion].
7. Ice on absorption of heat converts to 'X' a process called ____ [vaporization / melting]. 'X' changes to water vapour on ____ [heating / cooling]. Water vapour changes back to 'X' on ____ [freezing / condensation]. The constant temperature at which ice changes into 'X' is called its ____ [fusion point / melting point / boiling point].

Answer:
1. From the three states of matter, **solids** expand the least.
2. Brownian movement is maximum in **gases.**
3. Cohesive forces are negligible in **gases.**
4. Matter can change from one state to another by change in **temperature or pressure.**
5. The space between atoms [molecules] of solids is **minimum.**
6. Intermingling of molecules is called **diffusion.**
7. Ice on absorption of heat converts to 'X' a process called **melting. '**X' changes to water vapour on**heating**. Water vapour changes back to 'X' on **condensation.** The constant temperature at which ice changes into 'X' is called its **fusion point.**

Question 2.
State which of the following are physical properties of a substance.

1. Chlorine gas has a – strong irritating odour.
Ans. Physical.

2. Sodium nitrate is soluble in water, but calcium carbonate is not.
Ans. Physical.

3. Magnesium reacts with dilute hydrochloric acid, liberating hydrogen gas.
Ans. Chemical.

4. Manganese dioxide, a catalyst which alters the rate of a chemical reaction is black in colour.
Ans. Chemical.

5. The melting point of ice is 0°C.
Ans .Physical.

6. Lead chloride reacts with barium sulphate to give a white precipitate of lead sulphate.
Ans. Chemical.

7. Water acidified with dilute sulphuric acid is a good conductor of electricity.
Ans. Physical.

8. Naphthalene on heating directly turns into vapour.
Ans. Chemistry.

9. Hydrogen sulphide gas has a strong rotten egg odour.
Ans. Physical.

10. Sulphur is a yellow amorphous powder insoluble in water.
Ans. Physical.

Question 3.
Match the characteristics of the three states of matter in List I with their correct answer from List II.

List I	List II
1. Are highly rigid and have a definite shape	A : Solids and gases only
2. Have no definite shape	B : Solids only
3. Have a definite volume but no definite shape	C : Liquids and gases only
4. Are highly compressible and least rigid	D : Gases only
5. Have no definite volume	E : Solids, liquids and gases
6. Have no definite shape and volume	F : Liquids only
7. Occupy space	G : Solids and liquids only
8. Are not compressible	
9. Are slightly compressible	
10. Have mass	

Answer:

List I	List II
1. Are highly rigid and have a definite shape	B : Solids only
2. Have no definite shape	C : Liquids and gases only
3. Have a definite volume but no definite shape	F : Liquids only
4. Are highly compressible and least rigid	D : Gases only
5. Have no definite volume	D : Gases only
6. Have no definite shape and volume	D : Gases only
7. Occupy space	E : Solids, liquids and gases
8. Are not compressible	B : Solids only
9. Are slightly compressible	F : Liquids only
10. Have mass	E : Solids, liquids and gases

Question 4.

Match the arrangement of atoms in the three states of matter in List I with the correct state in List II.

List I	List II
1. Arrangement of atoms is far apart	**A : Solids**
2. Force of attraction between atoms is very strong	**B : Liquids**
3. Movement of atoms is in any random direction	**C : Gases**
4. Particles diffuse very easily	
5. Particles show movement about their own position	

Answer:

List I	List II
1. Arrangement of atoms is far apart	C : Gases
2. Force of attraction between atoms is very strong	A : Solids
3. Movement of atoms is in any random direction	C : Gases
4. Particles diffuse very easily	C : Gases
5. Particles show movement about their own position	A : Solids

Question 5.

State the correct term from A, B, C, D, E or F in List II which represents the change of state of matter or its relevant property from List I.

List I	List II
1. Solid 'X' to a Liquid 'Y'	**A : Condensation**
2. Liquid 'Y' to its vapour 'Z'	**B : Vaporization**
3. 'Z' to 'Y'	**C : Melting**
4. 'Y' to 'X'	**D : Freezing**
5. The temperature at which 'Y' changes to 'Z'	**E : Melting point**
	F : Boiling point

Answer:

List I	List II
1. Solid 'X' to a Liquid 'Y'	C : Melting
2. Liquid 'Y' to its vapour 'Z'	B : Vaporization
3. 'Z' to 'Y'	A : Condensation
4. 'Y' to 'X'	D : Freezing
5. The temperature at which 'Y' changes to 'Z'	F : Boiling point