NAME - JAGADISH PANIGRAHI
CLASS - VI, SEC - A, SCHOOL NO - 4659

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CHAPTER - 3 : MATTER
EXERCISE - 1

Ans-1) Any thing that has mass and occupies space is called matter.

Ans-2) 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 natural 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.

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3) Ans- 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.

4) Ans- Non natural matter: wood, silk, coal, water, fruits.
Man made matter: plastic, medicines, detergents, ceramic, cotton, glass, nylon.

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EXERCISE - II

1/ Ans - The smallest particle from which matter is made up is a atom.

Ans 2) Molecules are the smallest unit of matter. They exhibit all the properties of that kind of matter and is capable of independent existence.

Ans 3) Atoms may or may not have independent existance. while molecules have independent existence.

Ans:-4) (a) the molecules of matter are always in motion and attract each other with a force, and this force is called intermolecular 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 intermolecular space.

5) Ans - The three states of matter are:-
1. Solid State
2. Liquids
3. Gases:

1) Solid state:- The molecules are very close to each other hence intermolecular spaces are small and intermolecular force is strong. Hence solids have definite volume, rigid, retain definite shape and are incompressible.

2) Liquids: The molecules are less closely packed have more intermolecular spaces than solids, 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.

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

Ans 6. 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).

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7) Ans -

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

Ans 8) (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—

P.T.O—

- 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 inter molecular 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.

P.T.O —

(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.

9) Ans- (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 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

10) Ans- When we invert the bottle and blow air into the bottle through the side opening. It creates high pressure inside the bottles and the egg is kicked out of the bottle.

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EXERCISE - III

Ans:- 1/ When a substance is heated, it can cause.
1. Inter conversion of States of matter.
2. Thermal expansion of the substance.
3. Chemical change.

2) Ans- (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

ans- 3(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.

Solid $\underset{\text{cooling}}{\overset{\text{heating}}{\rightleftharpoons}}$ Vapour.

(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.

9) ans- (a) Solidification: The process of changing liquid into a solid state by cooling is known as Solidification.
Example: water → ice.
condesation: 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.

P.T.O →

- 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: Liquid which do not mix with each other are called immiscible liquids. Example water and oil.

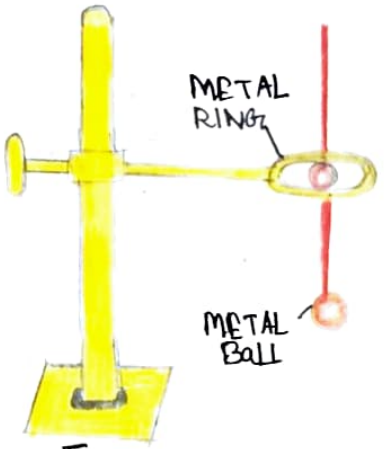
5) ans- (a) During inter conversion of state of matter composition of substance remains the same matter changes from one state to another and back to the original state, while chemical reaction involves re-arrangement of the molecular structure and composition changes.

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.

6. Ans - 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.

7/ans - water from oceans, rivers, lakes from leaves of trees (transpiration) changes into vapours when temperature increases or evaporates and enters the atmosphere 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 hails and this continues. Thus, water cycle is example of interconversion of states of water.

8/ans - 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 contracts on cooling.



I

The metal ball passes through the ring

II Metal ball is heated

III

The metal ball is unable to pass through the ring after being heated

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9. ans - on heating, candle wax melts, then turns into vapour which reacts with air to produce two new substances, carbon dioxide 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

Q-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 100°C.

(f) The physical state of a substance, which has neither fixed volume nor fixed shape is a gas.

Burning of a candle →  candle wax —heating→ carbon dioxide + water vapour

2. (a) Only water can exist in three different states. (True)

(b) If the container in which a gas is collected has an opening, the gas will flow out and spread itself indefinitely. (True)

(c) Solids have the largest intermolecular space. (False)

(d) There is no difference between evaporation and boiling. (False)

(e) All solids, on heating, first change to liquid and then to the gaseous state. (False)

(f) The intermolecular force of attraction is the weakest in gases. (True)

(g) A gas has no free surface. (True)

4. (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

5/

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 directly from solid to gas.

Ans- (a) — (iii), b) - (v), (c) - (ii), (d) - (i), (e) - (iv)

Ans- 6/ (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.

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7(a) Substances which sublime.
Ex:- Naphthalene, dry ice.

(b) Substances which do not change their state. Ex:- Oxygen, hydrogen.

(c) Substances which are rigid and not compressible EX:- Glass, pen.

MULTI CHOICE QUESTIONS

(1) which one is a kind of matter:-
ans-(b) petroleum

(2). The state of matter which has no definite shape or volume is called
ans-(c) gas

(3). There are large intermolecular gaps in
ans-(d) air

(4) All kinds of matter
ans-(a) occupy space and have a definite mass

(5) A kind of matter which can sublime is
ans-(d) iodine

(6) A substance which can change its state
ans - (b) Oxygen

(7) The process by which a solid changes into a liquid is called
ans - (b) melting

2/a) List the characteristics of Pure substance

(i) Pure substances have a perfectly homogeneous natural.
(ii) Pure substances are made up of only one type of atoms or molecules.
(iii) Pure substances have a fixed composition.
(iv) pure substances have a fixed density, melting point, boiling point etc.
(v) Pure substances have characteristic color, odour and taste.
(vi) pure substances cannot broken into simpler substances by any physical means.

(b)(i) Differentiate between Elements and compounds :-

Elements	compounds
An Element is defined as a pure substance made up of only one kind of atoms that cannot be converted into anything simpler than itself by any physical or chemical process	Compounds are pure substances formed by the chemical combination of two or more elements in a definite proportion by mass.

(ii) Differentiate between homogeneous and heterogeneous mixture :-

(i) A homogeneous mixture is that mixture in which the components mix with each other and its composition is uniform throughout the solution. A heterogeneous mixture is that mixture in which the composition is not uniform throughout and different components are observed.