chapter-1-Matter

B-Short/long question answer:

1- Define matter. What is its composition?

Ans- Matter is defined as anything which occupies space and has mass. It can be percieved by our sense of smell, touch, sight, hearning and taste. Matter is composed of tiny particles known as atoms.

2- Name the three states of matter.

Ans The three states of matter are solids, liquids and gases.

Solids- A solid has a definite shape and definite volume. Example- stone, wood, iron, ice etc.

Liquid- A liquid has a definite volume but no definite shape. Examples: water, juice, milk, oil etc.

Gases- A gas neither has definite volume nor a definite shape. Examples: air, hydrogen, oxygen, water vapour etc.

3- What is a molecule?

Ans- The smallest unit of matter which can exist independently is called molecule. Example: Oxygen molecule [O^2] made up of two [O] atoms.

4- Mention one example each of a monoatomic and diatomic molecules?

Ans- One example of monoatomic molecules: neon
One example of diatomic molecules: Oxygen.

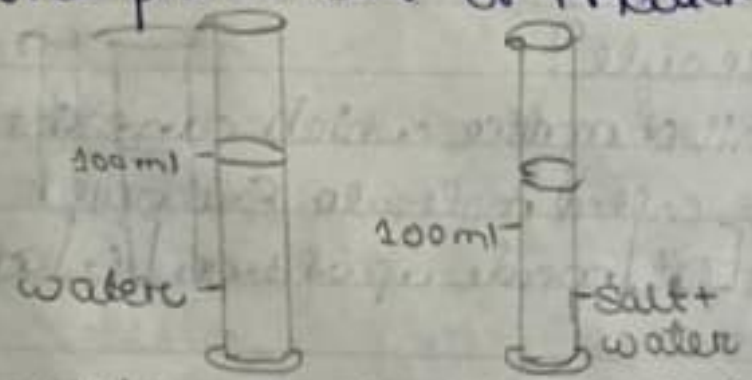
5- What do you mean by inter-molecular spacing?

Ans- Intermolecular- The space between any two consecutive molecules of a substance is called

inter molecular space.

6- Describe a simple experiment to illustrate the existence of inter molecular spacing.

Ans- Take 100 ml of water in a measuring cylinder. Add 20 gram of salt in water gently and stir it well so as to dissolve the salt well in water. It is noticed that the level of water. It shows that the particles of salt occupy spaces between the particles of matter.



a) Water alone b) salt added to water

The particles of salt occupy the spaces between the particles of water.

7- What do you mean by inter-molecular force?

Ans- Intermolecular force of attraction— The force of attraction between the molecules like molecules or unlike molecules is called intermolecular force of attraction.

8- What are forces of cohesion and adhesion?

Ans- The force of attraction between the molecules of similar kind is called force of cohesion?
Example: The forces between water molecules.
This forces of cohesion keep the molecules of the substance bind together.
The force of attraction between different types of molecules is called force of adhesion.
Example: When a glass filled with water is called emptied some water particles remain stuck to the glass due to the adhesion between water molecules and glass.

Q9- State three characteristics of molecules of matter which determine its solid, liquid and gaseous state?

Ans- The three characteristics/properties of molecules of matter which decide if's a solid, a liquid or gas: i- inter-molecular space
ii- movement of molecules and
iii- forces of attraction between the molecules

10- How do solids, liquids and gases differ in their following properties:
a) size b) shape. c) density?

Ans

Size	Solids	Liquids	Gases
Size	They have definite size	Indefinite	Indefinite
Shape	They have definite shape	Indefinite	Indefinite
Desity	Highly dense	Less denser than solids	Less denser than liquid and solids

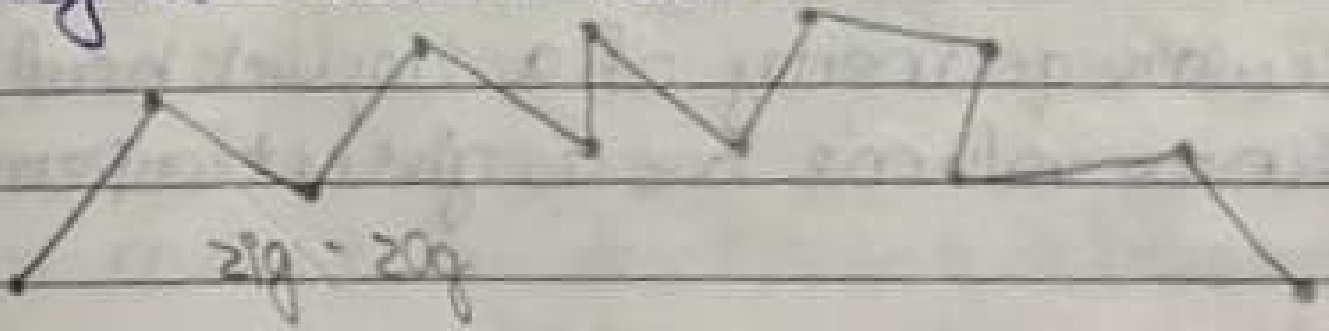
11- The molecules in a substance are in motion. What type of path do they follow?

Ans- The particles in a substance are not at rest [in motion], and they move randomly in all possible directions in a zig-zag path.

12- Describe a simple experiment to illustrate that molecules are not at rest, but they constantly move.

Ans Take a beaker. Fill it partly with water. Add some bulk of lycopodium powder in the beaker containing water. Stir the contents of the beaker with a glass of rod. Take out few

drops of this suspension on a glass plate. Place it on the table and illuminate it with a table lamp, observe the glass plate through a microscope. It is found that the fine particles of lycopodium powder move rapidly in a random manner ~~that~~ and their path is zig-zag as shown in below.



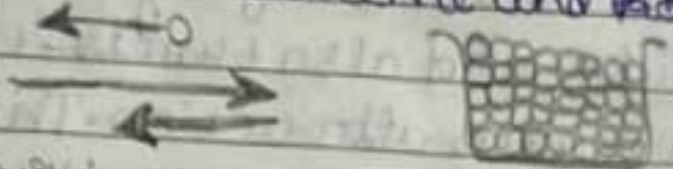
13. Write down five general properties of solids, liquids and gases.

Ans- Solids: The molecules here are very tightly packed having negligible or very less inter molecular space.
They have the strongest intermolecular force of attraction.
They molecules have very small vibration about their mean position i.e. small amplitude
They have a definite shape and volume.
They are generally hard and rigid.
They are good conductors of heat.
Liquids: Molecules are less tightly packed.
The intermolecular force of attraction is less than that of solids.
The molecules here can move from one place to another.
Do not have any particular shape of their own and thus acquire the shape of the vessel.
A particular quantity of a liquid head has a definite volume at a given temperature

Gases: The force of attraction between the molecules is the least.
The intermolecular space is the largest
Niether have a definite shape nor a definite volume.
The molecules move independently.
Worst Conductors of heat.

14- Give the molecular model for a solid and use it to explain why a solid has a definite volume and ~~no~~ definite shape.

Ans-



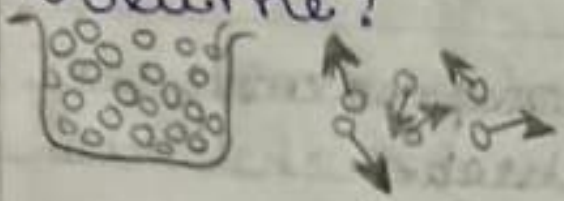
Vibration of molecule about its mean position.

Molecules of a solids are ~~arrange~~ arranged closely and in a definite manner not free to move.

Ans- ~~Here the molecules~~ Hence the molecules are very tightly packed that there is no or very less inter molecular space and there is high intermolecular force of attraction [Force of cohesion]. The molecules dont move about their mean position and their solid shape a definite shape

and volume.

15- Describe the molecular model for a liquid. How does it explain that a liquid has no definite shape, but has a definite volume?

Ans- 

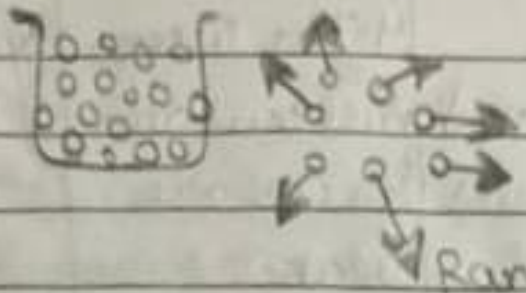
Motion of molecules

Molecules of a liquid arranged less closely are free to move about, within the liquid. Here the molecules are less tightly packed as compared to solids and also there is lesser force of intermolecular attraction. The intermolecular distance is greater than that in the solids. Thus they do not have a definite shape but acquire the shape of the vessel in which they are contained but have a definite volume at a given temperature.

16- A gas has neither a definite volume nor a definite shape. Describe the molecular model to explain it.

Ans- Here the molecules are far apart from each other i.e. have the greatest intermolecular distance which result into the weakest

intermolecular forces of attraction. The molecules as are not



Random motion of molecules.

Molecules of a gas are far apart and are free to about.

bound by any strong force move about freely and thus gases do not have a definite shape and also do not have any definite volume.

17- Distinguish between the three states of matter— solid, liquid and gas on the basis of their molecular models.

Ans- Distinguish between solids, liquids and gases —

	Solids	Liquids	Gases
1	A solid has a definite shape and a definite size [i.e. length area and volume]	A liquid has a definite volume but not a definite shape.	A gas has neither a definite shape. 2- The molecules in a gas are wide apart. 3- The molecules of a gas can move freely in space.
2	The molecules in	The molecules in a	

	Solids	Liquids	Gases
	a solid are closely packed.	liquid are loosely packed	4- The inter-molecular forces are weak.
3-	The molecules in a solid are fixed at their position. They can only vibrate about their mean positions	The molecules in a liquid can move within the boundary of the liquid	5- The molecules in a gas ~~can move freely in space~~ are loosely packed.
	mean positions	4- The inter-molecular	~~therefore~~
4-	The inter-molecular forces are very strong	forces are less strong [moderate].	gases are not rigid
5-	The molecules in a solid are closely packed, therefore solids are highly rigid	The molecules in a liquid are less closely packed, therefore, liquids are less rigid	

18- Distinguish between solids, liquids and gases on the basis of their following properties:

a) Compressibility
b) Fluidity
c) rigidity
d) expansion on heating.

Ans- Distinguish properties of solid, liquids and gases-

Properties	Solids	Liquids	Gases
Compressibility	Not compressible	Negligibly compressible	Highly compressible
Fluidity	Not possible	Can flow	Can flow
Rigidity	Highly rigid	Less rigid	Not rigid
Expansion on heating	Low	More than solids	More than liquids

19- What do you mean by change of state of matter? Explain?

a) the change of a solid into a liquid at a constant temperature, and
b) the change of a liquid into a gas at a constant temperature.

Ans- The change in state of matter of a substance from liquid to solid or from liquid to gas is bought by imparting heat energy to it at a constant temperature

a) The process of change of a substance from solid state into its liquid state on absorption of heat at a particular temperature called the melting point

is called melting or also fusion i.e

Solid $\xrightarrow[\text{Heat absorption}]{\text{Melting}}$ Liquid

b) The process of change of a substance from liquid state to its gaseous state at a particular is called boiling point or vaporisation, i.e.

Liquid $\xrightarrow[\text{Heat absoption}]{\text{Boiling}}$ Gas

20- Complete the following:

a) Solid $\xrightarrow{\text{Melting}}$ Liquid

b) Liquid $\xrightarrow{\text{Boiling}}$ Gas