B. Short/Long answer questions.

Q.1) Define matter. What is its composition?

Ans- Matter is defined as anything that occupies space and has mass. It can be perceived by our senses of smell, touch, sight hearing and taste. Matter is composed of tiny particles known as atoms.

Q2) 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 a definite volume.

Example- wood, stone, iron, ice etc.

Liquids- A liquid has a definite ~~shape~~ volume but no definite shape.

Example- water, juice, milk, oil etc.

Gases- A gas has neither a definite shape nor a definite volume.

3. What is a molecule?

Ans- The smallest unit of matter that can exist

independently is called molecule. Example: Oxygen molecule (O_2) made up of two (O) atoms.

Q4) Give two examples of monoatomic and diatomic molecules.

Ans- monoatomic - neon, argon.

diatomic - Oxygen (O_2), Nitrogen (N_2)

Q5) What do you mean by intermolecular spacing

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

Q6) Describe a simple experiment to illustrate the existance 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. If is noticed that the level of water does not change. It shows that the particles of salt occupy the space

7. What do you mean by inter-molecular forces?

Ans- Inter molecular forces of attraction - The force of attraction between the molecules (like molecules or unlike molecules) is called intermolecular forces of attraction

8. What are the 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 force 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 emptied some water particles remain stuck to the glass due to the adhesion between water molecules and glass.

Q. State three characteristics of molecules of matter which determine its solid, liquid and gaseous state.

Ans- The particles of matter called molecules, have the following characteristics:

1. They are very small in size

2. They have spaces between them.

3. They are in constant random motion.

4. They always attract each other

10. How do solids, liquids and gases differ in their following properties?

a) size, b) shape, c) Density.

Ans-

	Solids	Liquid	Gas
Size	They have definite size	Indefinite	Indefinite
Shape	They have definite shape	Indefinite	Indefinite
Density	Highly dense	Less dense than solids	Less dense than liquids.

Q11. The molecules in a substance are in motion, what kind of path do they follow?

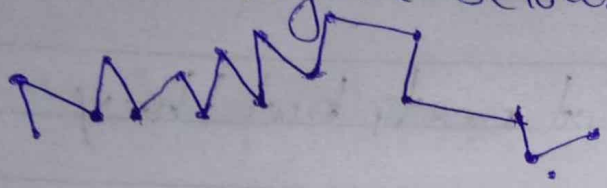
Ans- The particles in a substance are not at rest (in motion) and they move randomly in a zig-zag

path.

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

Ans: Take a beaker. Fill partly with water. Add some lycopodium powder in the beaker containing water. Stir the contents of the beaker with a glass 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. ~~Place it on the tab~~ through a microscope. It is found that the fine particles of lycopodium powder move rapidly in a random

manner and their path is zig zag as shown in the figure below:—



Zig zag path of fine particle of lycopodium powder

Q13. Write down five general properties of solids, liquids and gases.

Ans- Solids:

1. The molecules here are very tightly packed having negligible or very less intermolecular space.
2. They have the strongest intermolecular force of attraction.
3. The molecules have very small vibrations about their mean position i.e. small amplitude.
4. They have a definite shape and volume.
5. They are generally hard and rigid.

6. They are good conductors of heat.

Liquids:

1. Molecules are less tightly packed.

2. The intermolecular force of attraction is less than that of the solids.

3. The molecules here can move from one place to ~~another~~ another.

4. Do not have any particular shape of their ~~two~~ own and thus acquire the shape of their container.

5. A particular quantity of a liquid has a definite volume at a given temperature.

Gases:

1. The force of attraction between the molecules is the least.

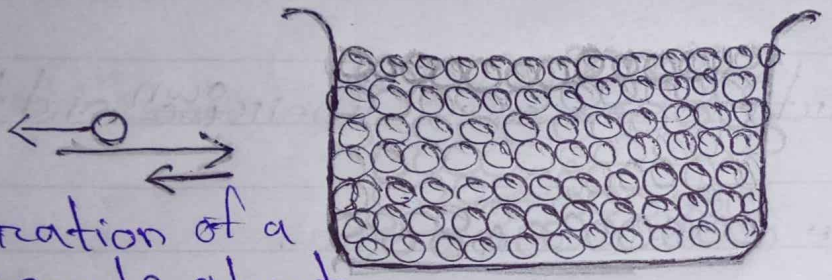
2. The inter molecular space is the least.

3. Neither have a definite shape nor a definite volume

4. The molecules move independently.

5. Worst conductors of heat

Q14. Give the molecular model for a solid and use it to explain why a solid has a definite volume and a definiti shape.



Vibration of a molecule about its mean position.

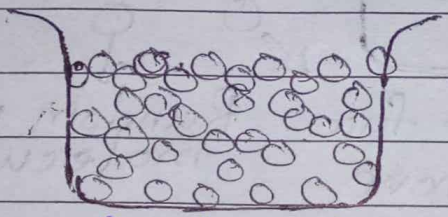
Molecules of a solid arranged closely to each other in a definite manner, not free to move around.

Here the molecules are very tightly packed that there is no or very less intermolecular space and there is high intermolecular force

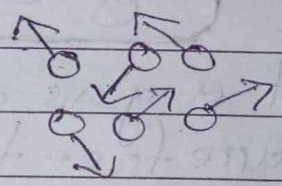
of attraction (force of cohesion). The molecules do not move about their mean position and thus solids have a definite shape and volume.

Q15 Describe the molecular model for a liquid. How does it explain that a liquid has no definite shape, but a definite volume?

Ans



Molecules of a liquid arranged less closely ~~free~~ are free to move about within the liquid.

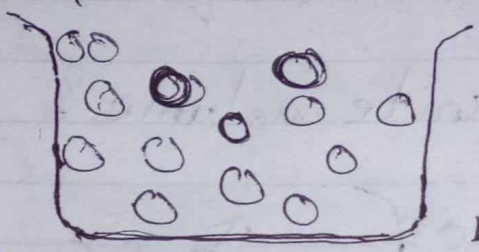


Motion of molecules.

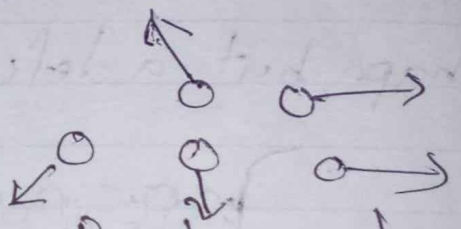
Here the molecules are less tightly packed as compared to solids and also there is lesser force of inter-molecular attraction. The intermolecular distance is greater than that in solids. Thus, they don't have a definite shape but acquire the shape of the vessel

in which they are contained but have a definite volume at a given temperature.

~~Q18.~~ Q.16. A gas has neither a definite volume nor a definite shape. Describe the molecular model to explain it.



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



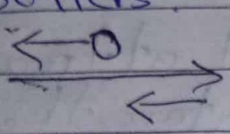
Random motion of molecules.

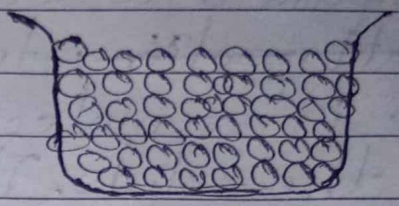
Here the molecules are far apart from each other i.e. have the greatest intermolecular distance which result into the weakest intermolecular forces of attraction. The molecules as are not bound by any strong force move about freely and thus gases do not have a definite shape and also do not

have a definite volume

Q17 Distinguish between the three states of ~~matt~~ matter - solid, liquid and gas on the basis of their molecular models.

Ans Solids:





Vibration of a molecule about its mean position.

Here the molecules are very tightly packed so that there is no or very less intermolecular space and there is high intermolecular force of attraction (force of cohesion). The molecules do not move about their mean position and thus solids have a definite shape and volume.

Liquids:

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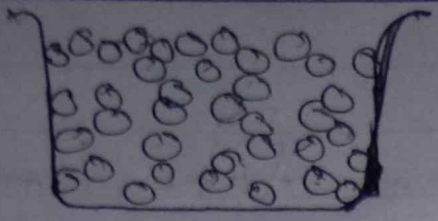
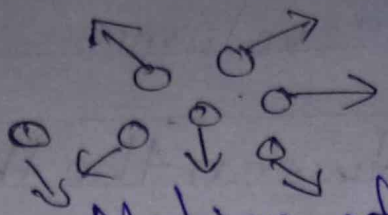
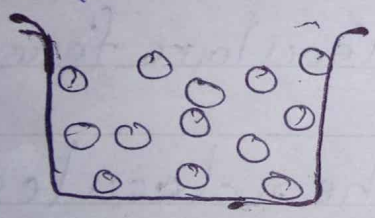


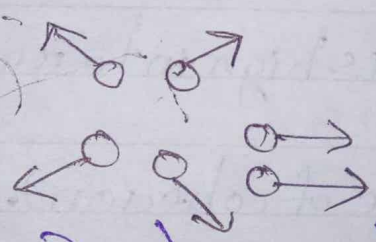


Motion of molecules

Here the molecules are less tightly packed as compared to solids and also there is lesser force of ~~attraction~~ intermolecular force of 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 given temperature.

Gases:





Random motion of molecules

Here the molecules are far apart from each other i.e. have the greatest intermolecular forces of attraction. The molecules as are not bound by any strong force move about freely and thus gasses do not have a definite shape and also do not have any definite volume.

18.

	Solids	Liquids	Gases
a) Compressibility	Not compressible	Negligibly compressible	Highly compressible
b) fluidity	Not possible	Can flow	Can flow
c) Rigidity	Highly rigid	Less rigid	Not rigid
d) Expansion on heating	Low	More than solids	More than liquids

21. The change in state of matter of a substance from solid to liquid or from liquid to gas is brought 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 fusion, i.e.

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

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Q.19.b) The process of change of a substance from a liquid state to its gaseous state at a particular temperature, called the boiling point is called boiling or vapourisation; i.e.

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

20. Solid $\xrightarrow{\text{Heating}}$ Liquid

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