

Matter(A) Objective questions

① write true or false for each statement.

a) The molecules of each substances are identical. (~~True~~) (False)

b) The inter-molecular forces are effective at all distances between the two molecules. (False)

c) The molecules in a substances are in random motion. (True)

d) In gas the molecules can move ~~any~~ anywhere in space. (True)

e) Liquides are less viscous than ~~gas~~ gases. (False)

② Fill in the blanks

a) All molecules of substances are identical

- b) The inter-molecular spacing is least in solid, more in liquids and most in gases
- c) The molecular motion in a liquid and gas is in zig-zag path.
- d) In a solid the molecules vibrates but they remain at their fix position.
- e) The inter-molecular force are weakest in gases.
- f) A solid exerts pressure downward on its base.
- g) Gases are least dens
- h) Solids are most rigid.

③ select the correct alternative :

- a) The diameter of molecule is approximately - ~~10^{-10} m~~ 10^{-10} m
- b) The inter-molecular forces are strongest in solids
- c) The molecules -
- d) Solids are : more dense
- e) The inter-molecular forces in ~~liqui~~ liquids are : weaker than in solids

④ Match the following columns :

A

B

- a) A molecule is composed of \rightarrow iii) atoms
- b) Ice, water and water vapour \rightarrow iv) are the three states of water
- c) An atom \rightarrow i) does not exist free in nature.

d) Gases → v) occupy space

e) The molecules of a solid → ii) can vibrate only up to about 10^{-10} m from their mean position.

(B) Short / Long answer questions

Q1 Define matter. What is its composition?

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

Q2 Name the three states of matter.

The three states of matter are :

Solid - A solid has definite shape and definite volume. Eg. wood, stone, ice etc.

Liquid : Liquid ~~has a definite~~ has a definite volume, but not definite shape. Eg - milk, oil, water etc.

Gases : A gas has neither a definite shape nor a definite volume. Eg - oxygen, air ~~and etc. and~~, water vapour etc.

Q4 Mention one example each of a monoatomic and a diatomic molecule.

Ans Matter is made up of molecules which are very small in size ($\sim 10^{-9}$ m).

~~Q6 What do you mean by inter-molecular spacing?~~

~~Q6 Describe a simple experiment to illustrate the existence of ~~the~~ inter-molecular~~

Q5 What do you mean by inter-molecular spacing?

Ans The space between any ~~two~~ two consecutive molecules of a substance

is called inter molecular space.

Q6 Describe a simple experiment to illustrate the existence of inter-molecular spacing.

Ans Take 100 ml of water in a measuring cylinder. Add 20 g of salt in water gently and stir it well. The salt is dissolved well in water, but ~~you~~ ^{we} notice that the level of water doesn't change. It ~~is~~ proves that the ^{particle} molecules of salt occupy space between ~~particle~~ particles of water.

Q7 What do you mean by inter-molecular forces?

Ans Inter-molecular force of attraction means the attraction between molecules. ~~is~~ constituent particles of ~~a~~ ^{the} molecules. For this force the particles of matter bind together.

Q8 What are the forces of cohesion and adhesion?

Ans The forces of attraction between the molecules of similar kind is called forces of cohesion. Eg- forces between water molecule. It ~~keep~~ keep the molecules of the substances bind together.

The forces of attraction between different type of molecule is called forces of adhesion. Eg- when a glass ~~of~~ filled with water is emptied some water particles remain stuck to the glass due to ~~add~~ adhesion between water molecules and glass.

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

Ans The particles of ~~water~~ matter are called molecules. The particles of molecules have the basic ~~as~~ characteristics like:

- * They are very small in size.
- * They have space between them.
- * They ~~move~~ ^{are} in constant random motion.
- * They always attract to each other.

Q10

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

a) Size, b) shape, c) Density ?

<u>Ans</u>	<u>Solids</u>	<u>Liquids</u>	<u>Gases</u>
Size	They have definite ^{size} shape	Indefinite	Indefinite
Shape	They have definite shape	Indefinite	Indefinite
Density	Highly dense	Lesser denser than solids	less dense than liquid and solids

Q11

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.

Q12 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 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 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.

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

inter-molecular space.

- 2) They have the strongest inter-molecular force of attraction.
- 3) The molecules have very small vibration 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 inter-molecular force of attraction is less ~~to~~ than that of Solids.
- 3) The molecules here can move from one place to another.
- 4) Do not have any particular shape of their own and thus acquire the shape of the vessel.

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 largest.
- 3) Neither have a definite shape nor a definite volume.
- 4) The molecules ~~are~~ move independently.
- 5) Worst conductors of heat.

Q 14 Give the molecular model for a solid and use it to explain why a solid has a definite volume and a definite shape.

Ans Molecules of a solid are arranged closely and in a definite shape, not free to move.

Here the ~~molecules~~ molecules are very tightly packed that there is no or very less inter-molecular space and there is high inter-molecular 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 volume?

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

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 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.

Q16

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

Ans

Here the molecules are far apart from each other i.e. have the greatest inter-molecular distance which result into the weakest inter-molecular forces of attraction. The molecules are 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 any definite volume.

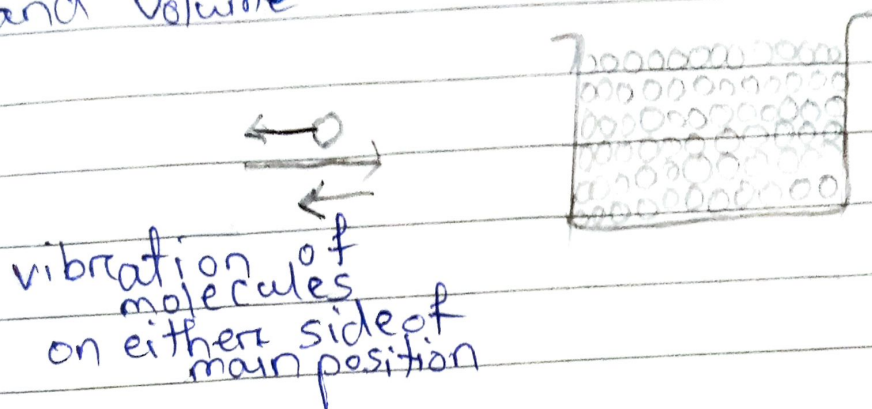
Q17

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

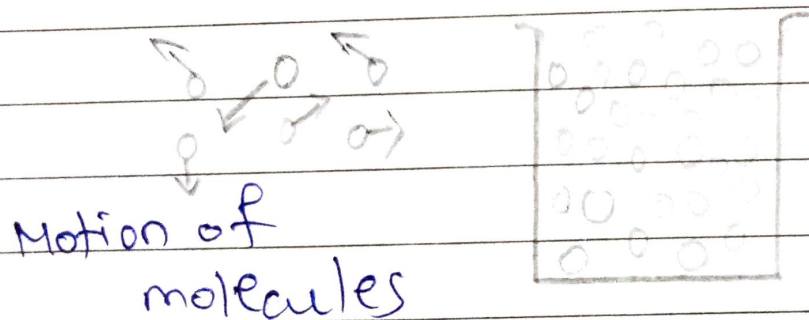
Ans

Solids : Here the molecules are very tightly packed that ~~they~~ there is no or very less inter-molecular space and there is high inter-molecular force of attraction the molecules don't move about their main position ~~and thus solids have a definite~~

and thus solids have a definite shape and volume.

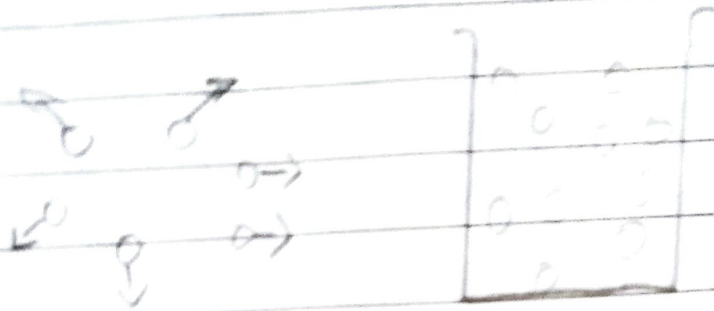


Liquids: Here the molecules are less tightly packed ~~that there~~ as compare to solids and there is less force of inter-molecular action. Thus, they don't have definite shape but acquire the shape of the vessel in which they contained but have a definite volume at a given temperature.



Gases: Here the molecules are far ^{apart} away from each other. They have greatest molecular distance for which the molecules

are not bound by any strong force and move about freely. Thus, gases have don't have definite shape and also don't have definite volume.



Random motion of molecules

Q18 Distinguish between solid, liquid and gases on the basis of their

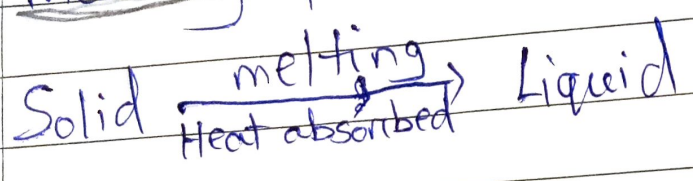
- a) compressibility
- b) fluidity
- c) rigidity
- d) expansion on heating

	Solids	liquids	Gases
a) Compressibility	Not compressible	Negligibly compressible	Highly Compressible
b) Fluidity	Not possible	Possible	Possible
c) Rigidity	Highly rigid	less rigid	not rigid
d) Expansion on heating	low Expansion	more than solid	more than liquid

Q19 What do you mean by change of state of matter? Explain. and by cool-

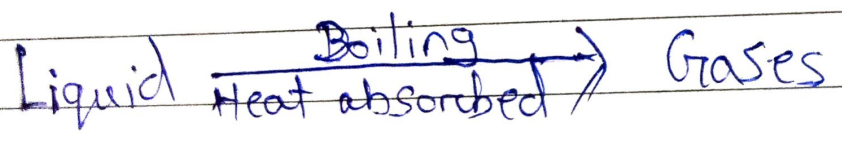
a) The change of a solid into a liquid at a constant temperature, and

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



b) The change of a liquid into a gas at a constant temperature?

Ans The process of change of substances from a liquid state to gaseous state at a particular temperature called boiling point.



Q20 Complete the following :

a) Solid $\xrightarrow[\text{Heat absorbed}]{\text{melting}}$ Liquid

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