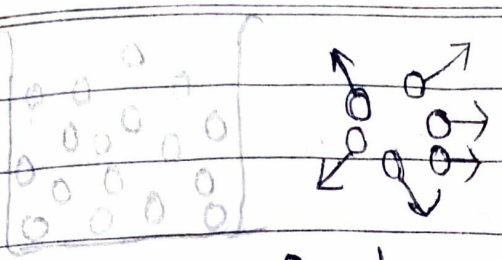
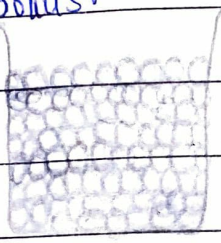


Random motion of molecules.

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

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

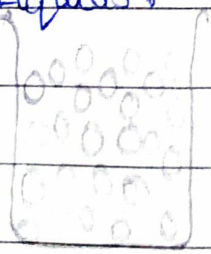
ans) Solids:



Vibration of a molecule about its mean position

Here the molecules are very tightly packed 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:



Motion of molecules

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.

Gasses:

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 are not bound by any strong force, move about freely and thus gases do not have any definite volume.

8) Distinguish between solids, liquids and gases on the basis of their following properties:

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

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ans)

	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

Q 19) What do you mean by change of state of matter? Explain:

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

ans) 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 to 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

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

2) Complete the following:

a) Solid ⟹ Liquid

b) _____ Boiling → Gas

ans) a) Solid melting Liquid

b) Liquid boiling Gas

4) Mention one example each of a monoatomic and a diatomic molecule.

ans) Monoatomic molecule: The molecules consisting of one atom is called monoatomic molecule.
Ex - Argon.

Diatomic molecule: The molecules consisting of two atoms is called diatomic molecule.
Ex - Oxygen molecule

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Objective Questions

A) 1) a) The molecules of each substance are identical. - False

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

c) The molecules in a substance are in random motion. - True

d) In a gas, the molecules can move anywhere in space. - True

e) Liquids are less viscous than gases. - False

2) a) All the molecules of a substance are identical.

b) The intermolecular spacing is least in solids, more in liquids and still more in gases.

c) The molecular motion in liquid and gas is in zig-zag path.

d) In a solid, the molecules vibrate & oneither side but they remain in their fixed positions.

f) The intermolecular forces are the weakest in gases.

f) A solid exerts pressure downwards on its base.

g) Gases are least dense.

h) Solids are most rigid.

3) a) The diameter of a molecule is approximately
ans) iii) 10^{-10} m

b) The inter-molecular forces are strongest in
ans) i) solids

c) The molecules
ans) ii) in a liquid, move within its boundary.

d) Solids are
ans) i) more dense

e) The intermolecular forces in liquids are
ans) iii) weaker than in solids

5. What do you mean by inter-molecular

4) Column A

a) A molecule is composed of

b) Ice, water and water vapour

c) An atom

d) Gases

e) The molecules of a solid.

Column B

i) does not not exist free in nature

ii) can vibrate only up to about 10^{-10} m from their mean positions.

iii) atoms

iv) are the three states of water

v) occupy space

a - iii, b - iv, c - i, d - v, e - ii