# Chapter - 1

## Matter

Objective Questions :-

Q.1 Write true or false for each statement :

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

(b) The inter-molecular 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) The liquids are less viscous than the gases. - False

Q.2 Fill in the blanks :

(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 on either side but they remain at their fixed positions.

(e) The inter molecular forces are the weakest in gases

(f) A solid exerts pressure downwards on its base

(g) The gases are least dense.

(h) A solid is most rigid.

Q.3 Select the correct alternative :

(a) The diameter of a molecule is approximately
(i) 1 cm
(ii) 10 cm
✓ (iii) $10^{-10}$ m.
(iv) 1 m.

(b) The inter molecular forces are strongest in
✓ (i) solids
(ii) liquids
(iii) gases
(iv) both (i) and (ii).

(c) The molecules
(i) in solid, liquid and gas move freely anywhere.
(ii) in a solid move freely within its boundary.
✓ (iii) in a liquid move within its boundary.
(iv) in a gas move only within its boundary.

(d) The solids are
✓ (i) more dense
(ii) less dense
(iii) least dense
(iv) highly compressible.

(e) The inter molecular forces in liquids are
(i) as strong as in solids
(ii) stronger than in solids.
✓ (iii) weaker than in solids
(iv) weaker than in gases.

Q.4. Match the following columns.

| A | B |
|---|---|
| (a) A molecule is composed of | (i) does not exist free in nature. |
| (b) Ice, water and water vapour | (ii) can vibrate only upto about $10^{-10}$ m from their mean positions. |
| (c) An atom | (iii) atoms. |
| (d) Gases | (iv) are the three states of water. |
| (e) The molecules of a solid | (v) occupy space. |

Short Answer Questions:

Q-1 Define matter. What is its composition?

Ans:- Matter is defined as anything which occupies space and has mass. It can be perceived by our senses of smell, touch, sight, hearing and taste.

Matter is composed of molecules.

Q.2. Name the three states of matter.

Ans:- The three states of matter are solid, liquid and gas.

Q.3. What is a molecule.

Ans:- A molecule is the simplest and smallest particle of substance that is capable of independent existance.

Q.4 What is the approximate size of a molecule?

Ans:- The diameter of a molecule is nearly $1.45 \times 10^{-10}$ metre.

Q.5 One litre of water has $6.02 \times 10^{26}$ molecules. Estimate the size of a molecule.

Ans: 1 litre $= 10^{-3}\ m^3$.

volume of 1 molecule $= \frac{10^{-3}}{6.02 \times 10^{26}}\ m^3$.

or $\frac{4}{3}\pi r^3$ $= 1.6 \times 10^{-30}\ m^3$.

or $r$ $= 0.725 \times 10^{-10}\ m$

Q.6 - What do you mean by inter molecular spacing?

Ans:- The spacing between particles of matter is called inter-molecular space.

Q.7 Describe a simple experiment to illustrate the existance of intermolecular spacing.

Ans:- Take 100 ml of water in a measuring cylinder. Add 20 gram of salt in water gently and stir it well. It is noticed that the level of water does not change. It shows that the particles of salt have occupied the spaces between the particles of water.

## Work Sheet

1. Define the term matter. What is it composed of?

2. State three properties of molecules of matter

3. What do you mean by inter molecular space? How do they vary in different states of matter

4. What is meant by intermolecular forces of attraction? How do they vary in solids, liquids and gases?

5. Which of the following are correct?

   (a) Solids have definite shape and definite volume.
   (b) Liquids have definite volume but no definite shape.
   (c) Gases have definite volume but no definite shape.
   (d) Liquids have both definite shape and definite volume.