



## IN-TEXT QUESTIONS SOLVED

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Question 1. Which of the following are matter?

Chair, air, love, smell, hate, almonds, thought, cold, cold-drink, smell of perfume.

Answer: Chair, air, almonds and cold-drink.

Question 2. Give reasons for the following observation:

The smell of hot sizzling food reaches you several metres away, but to get the smell from cold food you have to go close.

Answer: The smell of hot sizzling food reaches several metres away, as the particles of hot food have more kinetic energy and hence the rate of diffusion is more than the particles of cold food.

Question 3. A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

Answer: A diver is able to cut through water in a swimming pool. This shows that the particles of water have intermolecular space and has less force of attraction.

Question 4. What are the characteristics of the particles of matter?

Answer. The characteristics of the particles of matter are:

- (1) Particles have intermolecular space.
- (2) Particles have intermolecular force.
- (3) Particles of matter are moving continuously.

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Question 1. The mass per unit volume of a substance is called density.

(density = mass/volume).

Arrange the following in order of increasing density: air, exhaust from chimneys, honey, water, chalk, cotton and iron.

Answer: Increasing density:

air < exhaust from chimneys < cotton < water < honey < chalk < iron.

Question 2. (a) Tabulate the differences in the characteristics of states of matter.

(b) Comment upon the following: rigidity, compressibility, fluidity, filling a gas container, shape, kinetic energy and density.

Answer: (a) Difference in the characteristics of 3 states of matter.

Characteristics	Solid	Liquid	Gas
1. Shape	fixed shape	no fixed shape	no fixed shape
2. Volume	fixed volume	fixed volume	no fixed volume
3. Rigidity/fluidity	are rigid, cannot flow	can flow, not rigid	can flow, not rigid
4. Intermolecular force	maximum	less than solids	very less
5. Intermolecular space	very less	more than solids	maximum
6. Compressibility	negligible	compressible	and less than gas highly compressible

(b) Comment on:

(i) Rigidity: The tendency of a substance to retain/maintain their shape when subjected to outside force.

- (ii) Compressibility: The matter has intermolecular space. The external force applied on the matter can bring these particles closer. This property is called compressibility. Gases and liquids are compressible.
- (iii) Fluidity: The tendency of particles to flow is called fluidity. Liquids and gases flow.
- (iv) Filling of a gas container: Gases have particles which vibrate randomly in all the directions. The gas can fill the container.
- (v) Shape: Solids have maximum intermolecular force and definite shape.  
Whereas liquids and gases take the shape of container.
- (vi) Kinetic energy: The energy possessed by particles due to their motion is called kinetic energy. Molecules of gases vibrate randomly as they have maximum kinetic energy.
- (vii) Density: It is defined as mass per unit volume, the solids have highest density.

Question 3. Give reasons

- (a) A gas fills completely the vessel in which it is kept.
- (b) A gas exerts pressure on the walls of the container.
- (c) A wooden table should be called a solid.
- (d) We can easily move our hand in air but to do the same through a solid block of wood we need a karate expert.

Answer: (a) The molecules of gas have high kinetic energy due to which they keep moving in all directions and hence fill the vessel completely in which they are kept.

(b) A gas exerts pressure on the walls of the container because the molecules of the gas are in constant random motion due to high kinetic energy. These molecules constantly vibrate, move and hit the walls of the container thereby exerting pressure on it.

(c) The molecules/particles of wooden table are tightly packed with each

other, there is no intermolecular space, it cannot be compressed, it cannot flow, all these characteristics are of solid. So wooden table should be called a solid.

(d) We can easily move our hand in air but to do the same through a solid block of wood we need a karate expert. It is because the molecules of air have less force of attraction between them and a very small external force can separate them and pass through it. But in case of solids, the molecules have maximum force of attraction, the particles are tightly bound due to this force. Hence large amount of external force is required to pass through solid.

Question 4. Liquids generally have lower density as compared to solids. But you must have observed that ice floats on water. Find out why.

Answer: Ice is a solid but its density is lower than water due to its structure. The molecules in ice make a cage like structure with lot of vacant spaces, this makes ice float on water.

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