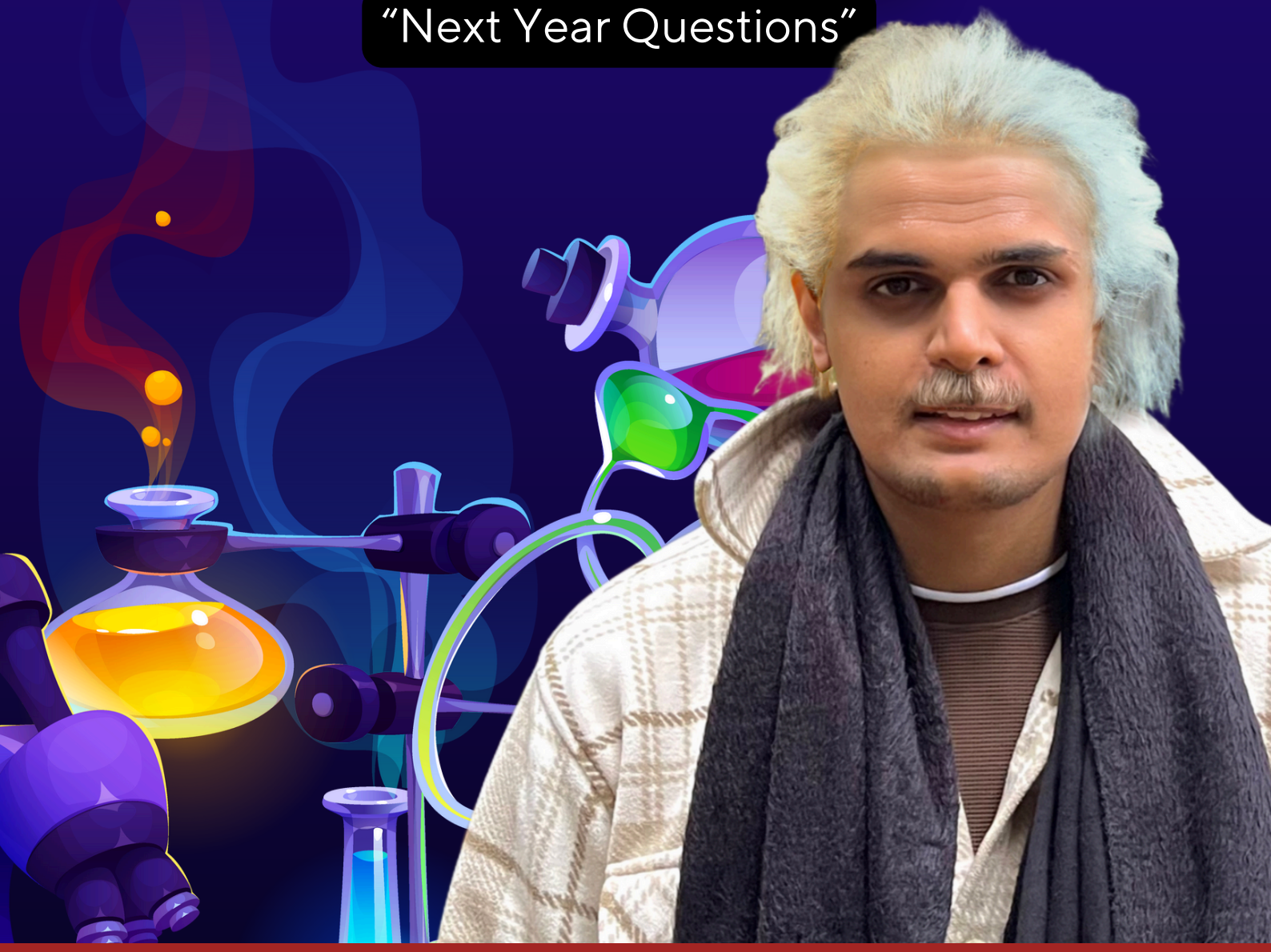
Next Toppers

Class IX

अभय

NYQs

"Next Year Questions"



Matter in our Surroundings

PRASHANT KIRAD

Matter in our Surroundings

Q1. What happens to the arrangement of particles when a substance changes from solid to liquid state?
A) Particles come closer together
B) Particles move further apart
C) Particles become arranged in a regular pattern
D) None of the above

Q2. Which of the following statement is correct?
(a) Substances that exist as liquids at room temperature typically have melting and boiling points lower than that of room temperature.
(b) The process in which a substance transitions directly from a solid to a gas state without going through the liquid state is known as sublimation.
(c) To convert a temperature from the Celsius scale to the Kelvin scale, add 273 to the given temperature.
(d) The density of ice is lower than that of water.

Q3. Which one of the following set of phenomena would increase on raising the temperature?
(a) Diffusion, evaporation, compression of gases
(b) Evaporation, compression of gases, solubility
(c) Evaporation, diffusion, expansion of gases
(d) Evaporation, solubility, diffusion, compression of gases

Q4. The process of conversion of a solid into a gas without passing through the liquid state is called
A) Evaporation
B) Condensation
C) Sublimation
D) Fusion

Q5. When water at 0°C freezes to form ice at the same temperature of 0°C, then it:
(a) Absorbs some heat
(b) Releases some heat
(c) Neither absorbs nor releases heat
(d) Absorbs 3.34×10^{5} J/kg of heat

Q6. Water as ice has a cooling effect, whereas water as steam may cause severe burns. Explain these observations.

Q7. What do you understand by the term 'latent heat of fusion'? How much is the latent heat of fusion of ice?

Q8. Substance 'A' has high compressibility and can be easily liquefied. It can take up the shape of any container. Predict the nature of the substance. Enlist four properties of this state of matter.

Q9. Liquids and gases can be compressed but it is difficult to compress solids. Why?

Q10. The melting point of ice is 275 K. What does this mean? Explain in detail.

Q11. When a crystal of potassium permanganate is placed in a beaker of water, its purple color spreads throughout. What does this observation conclude about potassium permanganate and water?

Q12. Convert the following temperature to Celsius scale:
i)The temperature is 300 K
ii)The temperature is 573 K

Q13. Why are we able to sip hot tea or milk faster from a saucer rather than a cup?

Q14. What are the characteristics of the particles of matter?

Q15. Comment upon the following: rigidity, compressibility, fluidity, filling a gas container, shape, kinetic energy, and density.

SOLUTION

Ans 1. B

Ans 2. D

Ans 3. C

Ans 4. C

Ans 5. B

Ans6. Water turns into ice when the temperature decreases to 0°C. Water turns into steam at 100°C when heat is supplied to the water. Water as steam has more latent heat, while water as liquid does not. Hence, water as steam may cause severe burns, while water as ice has a cooling effect.

Ans 7. The amount of heat that is required to change 1 kg of solid into liquid at atmospheric pressure without any change in temperature at its melting point, is known as latent heat of fusion. The latent heat of fusion of ice in SI unit is 3.35×10^5 J/kg.

Ans 8. A' is a gas.
Properties of gases:

- **They do not have fixed shape and fixed volume.**
- **They have large interparticle space.**
- **They have least forces of attraction between the molecules.**
- **They are highly compressible.**

Ans 9. Liquids and gases have intermolecular space, on applying pressure externally on them the molecules can come closer thereby minimizing the space between them. But in case of solids there is no intermolecular space to do so.

Ans 10. Ice is solid at 0°C i.e., 273 K. The molecules of ice are tightly packed. These molecules have to overcome the force of attraction with which they are held and hence they gain this heat from the surrounding but the temperature remains the same as their energy is used to overcome the force of attraction between the particles. The particles have their state and starts

vibrating freely and a stage reaches when the solid ice melts and is converted to liquid state at the same temperature i.e., 273 K.

Ans11. The purple color spreading throughout the water indicates diffusion. Potassium permanganate, being a solid, initially settles at the bottom, but water molecules collide with it and the particles intermingle due to sufficient space between the molecules in the liquid state.

Ans 12. : The temperature is 300 K.
K = 273 + C :
C = K - 273
= 300 – 273
= 27 C
The temperature is 573 K
When we use:
K = 273 + C
C = 573 - 273
= 300 °C

Ans 13. When we use a saucer instead of a cup the surface for evaporation to occur will be increased resulting in faster evaporation of particles of tea or milk and allowing it to cool faster and taking a sip becomes easier.

Ans 14. The particles of matter have the following characteristics:
i.The particles of matter are in continuous motion.
ii. There are gaps between the particles of matter.
iii.There is a force of attraction between the particles of matter which keeps them together.

Ans 15. Rigidity: This is the ability of matter to keep its shape when forces are applied. Solids have rigidity.
Compressibility: This is the ability to be squashed when pressure is applied. Some liquids and all gases can be compressed.

Fluidity: This is the ability to flow and change shape when a force is applied. Liquids and gases exhibit fluidity.

Filling a gas container: Gases can be easily compressed and fill any container they are in, which makes them cost-effective to transport

Shape: Solids have a definite shape, while liquids take the shape of their container, and gases have no fixed shape.

Kinetic Energy: Particles in matter are always moving. Solids have the least movement and kinetic energy, while gases have the most movement and highest kinetic energy. The order is: solid < liquid < gas.

Density: Density is the mass of a substance per unit volume, calculated as density = mass/volume.