

Matter In Our Surroundings: Exercise Questions

Q.1 Convert the following temperature to the Celsius scale.

- (a) 293 K
- (b) 470 K

Sol.

- (a) Temperature in Celsius scale ($^{\circ}\text{C}$) = Temperature in Kelvin scale (K) - 273
 $\Rightarrow 293 \text{ K} - 273 = 20^{\circ}\text{C}$
- (b) Temperature in Celsius scale ($^{\circ}\text{C}$) = Temperature in Kelvin scale (K) - 273
 $\Rightarrow 470 \text{ K} - 273 = 197^{\circ}\text{C}$

Q.2 Convert the following temperature to the Kelvin scale.

- (a) 25°C
- (b) 373°C

- Sol.**
- (a) Temperature in Kelvin scale (K) = Temperature in Celsius scale ($^{\circ}\text{C}$) + 273
 $\Rightarrow 25^{\circ}\text{C} + 273 = 298 \text{ K}$
 - (b) Temperature in Kelvin scale = Temperature in Celsius scale ($^{\circ}\text{C}$) + 273
 $\Rightarrow 373^{\circ}\text{C} + 273 = 646 \text{ K}$

Q.3 Give reason for the following observations.

- (a) Naphthalene balls disappear with time without leaving any solid.
- (b) We can get the smell of perfume sitting several meters away.

- Sol.**
- (a) Naphthalene ball is a sublimate substance and a sublimate changes directly into vapour without changing into liquid state. Thus, naphthalene balls disappear with time without leaving any solid.
 - (b) Perfume contains volatile substance which turns into gas at room temperature. The vapour of perfume travels up to several meters because of faster diffusion. That's why we can get the smell of perfume sitting several meters away.

Q.4 Arrange the following substances in increasing order of forces of attraction between the particles Water, Sugar, Oxygen.

- Sol.** Force of attraction between the particles of these substances:
Oxygen < Water < Sugar

Q.5 What is the physical state of water at?

- (a) 25°C
- (b) 0°C
- (c) 100°C

Sol.

- (a) At 25°C –in liquid state.
- (b) At 0°C –in solid state.
- (c) At 100°C –in liquid and gas both (transition state)

Q.6 Give two reasons to justify

- (a) Water at room temperature is a liquid.
- (b) An iron almirah is a solid at room temperature.

Sol. (a) At room temperature:

- (i) Because its freezing point is 0°C and boiling point is 100°C . So, at the room temperature water is a liquid. At this state, it has definite volume, but not definite shape as it takes the shape of the container in which it is kept.
- (ii) Water flows at room temperature.

(b) An iron almirah is a solid at room temperature because:

- (i) Iron has melting point $1,538^{\circ}\text{C}$ which is higher than room temperature.
- (ii) At this state, it has definite shape and definite volume.

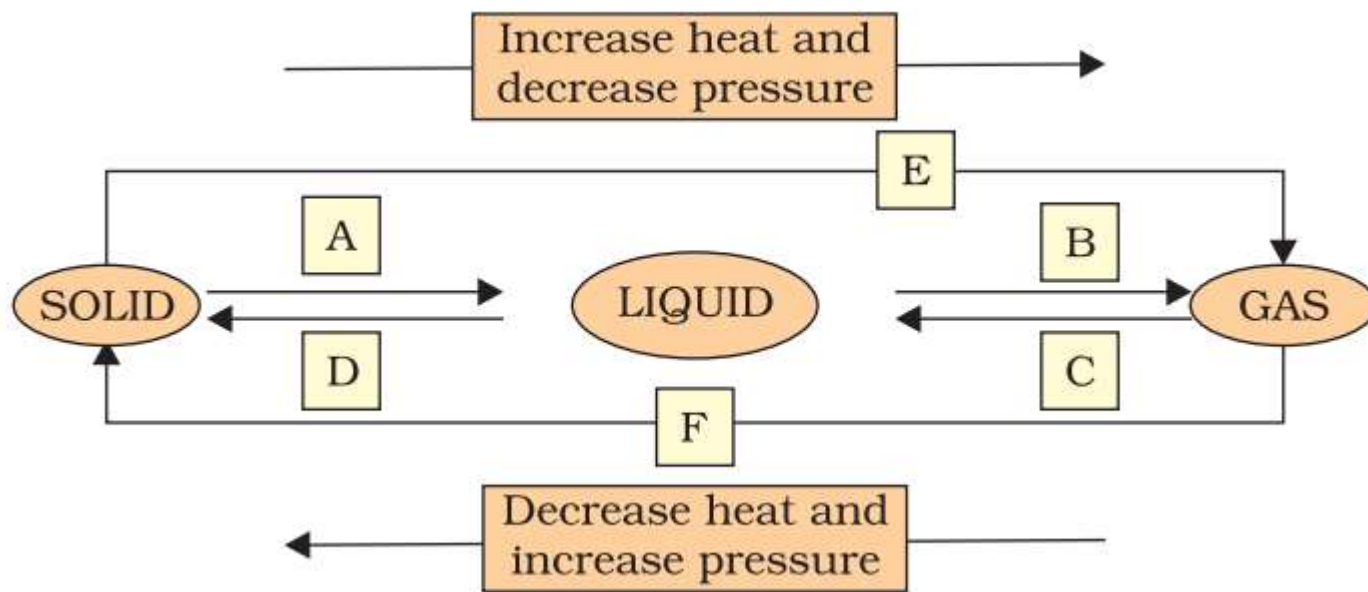
Q.7 Why is ice at 273K more effective in cooling than water at the same temperature?

Sol. At 273K or 0°C ice requires more latent heat from the medium to melt into water, while water at 273K requires less latent heat to come to ice the room temperature. So, ice at 273K is more effective in cooling than water at the same temperature.

Q.8 What produces more severe burns, boiling water or steam?

Sol. Steam produces more burns than boiling water, because steam has heat of 100°C and latent heat which is more than heat of boiling water.

Q.9 Name A, B, C, D, E and F in the following diagram showing change in its state.



Sol.

- A – heating or Melting
- B – Heating or Vapourisation
- C – Cooling or Condensation
- D – Cooling
- E – Sublimation
- F – Solidification