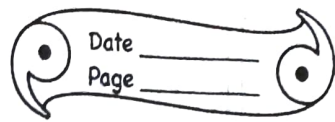


# Test Yourself



- A) 1) a. The temperature of a substance remains unaffected during its change of state. True
- b. Ice melts at  $100^{\circ}\text{C}$ . False
- c. Water at  $100^{\circ}\text{C}$  has more heat than steam at  $100^{\circ}\text{C}$ . False
- d. Evaporation of a liquid causes cooling. True
- e. Water evaporates only at  $100^{\circ}\text{C}$ . False
- f. Boiling takes place at all temperatures. False
- g. Evaporation takes place over the entire mass of the liquid. False
- h. The process of a gas converting directly into solid is called vaporization. False

- i) At high altitudes, water boils above  $100^{\circ}\text{C}$ . False
- j) The melting point of ice is  $0^{\circ}\text{C}$ .  
True
- 2) a) Evaporation takes place at all temperatures.
- b) Freezing process is just the reverse of melting.
- c) Sublimation process is just the reverse of melting.
- d) The temperature at which a solid converts into a liquid is called its melting point.
- e) The smallest unit of matter that exists freely in nature is called molecule.
- f) Molecules of a substance are always in a state of motion and so they possess kinetic energy.
- g) Inter-molecular space is maximum in gases less in liquids and the least in solids.



h) Inter-molecular force of attraction is maximum in solids, less in liquids and the least in gases.

3)	Column A	Column B
a)	Molecules	Matter
b)	100°C	Water boils
c)	0°C	Water freezes
d)	At all temperatures	Evaporation
e)	Camphor	Changes from solid to gas

4) a) The inter-molecular force is maximum in :  
i) Solids

b) The inter-molecular space is maximum in :  
iii) Gases

c) The molecules can move freely anywhere in :  
i) Gases

d) The molecules move only within the boundary in:  
i) liquids

e) The temperature at which a liquid gets converted into its vapour state is called its:  
ii) boiling point

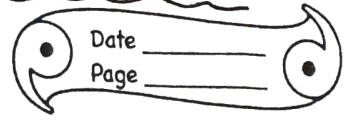
f) Rapid conversion of water into steam is an example of:  
iv) vaporization

g) Evaporation takes place from the:  
i) surface of liquid

h) Boiling takes place from:  
ii) throughout the liquid



## B) Short/Long Answer Questions:



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

Ans- Matter is anything which occupies space, has mass and can be perceived by our senses. Matter is composed of very tiny particles called molecules. A molecule can exist free in nature and it has all the properties of that substance.

2) State three properties of molecules of matter.

Ans- The three properties of molecules of matter are:

- \* They are very small in size.
- \* They have spaces between them.
- \* They are in constant motion as they possess kinetic energy.

3) What do you mean by inter-molecular spaces? How do they vary in different states of matter?

Ans- The space between the molecules of matter is called inter-molecular space. It is less in solids, more in liquids



and still more in gases. In other words, molecules are very closely packed in solids, less in liquids and least in gases.

4) What is meant by inter-molecular forces of attraction? How do they vary in solids, liquids and gases?

Ans - The molecules of matter exert a force of attraction on each other. This force of attraction is called inter-molecular force of attraction. The force of attraction between the molecules of a solid is very strong, while it is less strong between the molecules of a liquid and negligible between the molecules of a gas.

- 5) Which of the following are correct?
- Solids have definite shape and definite volume.
  - Liquids have definite volume but no definite shape.
  - Gases have definite volume but no definite shape.
  - Liquids have both definite shape and definite volume.



Ans- Both a and b are correct.

6) Discuss the three states of matter: solid, liquid and gas on the basis of molecular model.

Ans- Solid

When inter-molecular force is very strong and kinetic energy is very less, the inter-molecular space is reduced and matter exists as a solid.

\* Each solid is made up of very tiny particles called molecules. These molecules are very small in size.

\* The molecules in a solid can only vibrate to and fro about their mean positions.

\* The molecules in a solid are closely packed due to the strong attractive forces between them.

Liquid

When inter-molecular force between the constituent molecules is not much strong and kinetic energy is sufficient for the molecules to move to and



less, the inter-molecular space is increased and matter exists as a liquid.

- \* Each liquid is made up of very tiny particles called molecules. These molecules are very small in size and they are not in a rigid arrangement.
- \* The liquid molecules can move about freely within the boundary of the vessel in which the liquid is kept.
- \* The molecules in a liquid are less closely packed and their positions are not fixed as they are free to move within the boundary of the vessel.

## GASES

When inter-molecular force is negligible and kinetic energy is very high, matter exists as a gas.

- \* Like solids and liquids, gases are made up of very tiny particles called molecules.
- \* The separation between the molecules



is quite large as compared to that in liquids and solids.

\* The molecules in a gas can move about freely in the space available to them.

\* The molecules in a gas are wide apart and their positions are not fixed because the inter-molecular forces in them are very weak. The arrangement of molecules in a gas.

8) Differentiate between melting point and boiling point, giving at least one example of each.

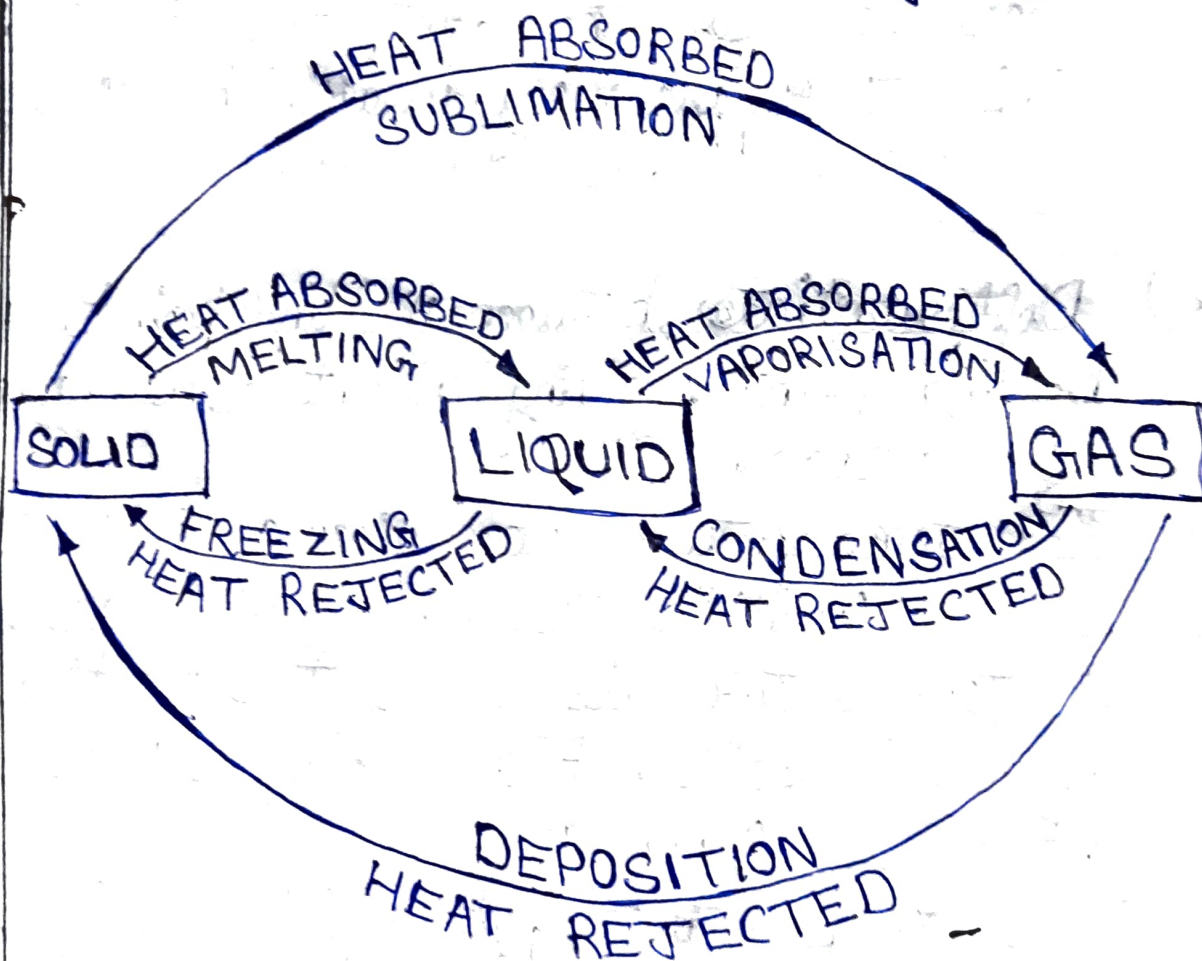
Ans- The temperature at which a solid changes into liquid without further increase in temperature is called the melting point of the solid. For example: ice melts at  $0^{\circ}\text{C}$ .

The temperature at which a liquid changes into vapour without further increase in temperature is called the boiling point of the liquid. For example: water boils at  $100^{\circ}\text{C}$ .



7) What do you mean by 'the change of state'? Write the flow chart showing the complete cycle of change of state.

Ans- The process of change from one state to another state either by absorption or rejection of heat at a constant temperature is called change of state.



9) Describe the process of condensation and sublimation with examples.

Ans- The change from vapour state to liquid state at a constant temperature



on rejecting heat or cooling is called Condensation.

Example: Steam at  $100^{\circ}\text{C}$  condenses to water on cooling.

Sublimation is the process by which a solid when heated, directly changes into its vapour without first changing into liquid.

Example: When ammonium chloride, iodine, camphor and dry ice are heated, they directly change into their vapour states.

10) Explain the terms melting and melting point.

Ans- The change from the solid state to the liquid state on heating at a fixed temperature is called melting. The temperature at which a solid changes into liquid without further increase in temperature is called the melting point of the solid.

11) Describe an experiment to demonstrate



that a substance absorbs heat during melting without change in its temperature.

Ans-

### Activity

Procedure :-

Take a test tube. Put some wax in the test tube. Clamp the test tube in a vertical stand and place the test tube in a beaker of water placed on a wire gauze at a tripod stand. Clamp a thermometer in the same vertical stand and insert the thermometer in the test tube such that the bulb of the thermometer is inside the wax. Heat the beaker over the flame of a burner and record the temperature of the wax after every minute.

Observations :-

You will observe that wax melts at  $55^{\circ}\text{C}$  during which heat is supplied, but temperature does not rise. The heat is absorbed during the melting process which is the hidden heat. After the melting of the wax, the temperature begins to rise.



15) Describe an experiment to demonstrate that water absorbs heat during boiling at a constant temperature.

Ans-

### Activity

Take a beaker. Pour some water in the beaker. Place the beaker on a wire gauze placed over a tripod stand. Clamp a thermometer in a vertical stand and insert it in the beaker. Heat the beaker over the flame of a burner and record the temperature of water after every minute.

Observations:-

You will observe that the temperature of water rises continuously till the water starts boiling at  $100^{\circ}\text{C}$ . As, the temperature does not rise any further the water starts boiling. The hidden heat is absorbed by water. Thus, the boiling point of water is  $100^{\circ}\text{C}$ .

17) What is evaporation?

Ans- The change of state from liquid to vapour at all temperatures from the surface of a liquid is called



evaporation. It is another process by which a liquid changes into vapour.

24) Explain with an example that when a liquid evaporates, it takes heat from its surroundings.

Ans- If a little spirit or alcohol is poured on the palm, it gives a soothing sensation. This shows that cooling is produced when a liquid evaporates. The reason for cooling in evaporation is that when a liquid changes into vapour, it requires heat. It absorbs heat in its surroundings, which results in fall in temperature in the surroundings.

25) Give two applications of evaporation.

Ans- Application of evaporation :-

\* We often pour tea in a saucer to cool it faster. In the saucer, the surface area of tea increases and evaporation becomes faster.

\* Evaporation of sweat from our body helps to maintain the body temperature at  $37^{\circ}\text{C}$ . When sweat evaporates, it



requires heat which it takes away from our body. As a result, temperature falls to keep the body at  $37^{\circ}\text{C}$ .

27) A patient suffering from high fever is advised to put wet cloth strips on his forehead. Why?

Ans- Doctors advice to put the strips of wet cloth on the forehead of a patient having high fever. The reason is that water of the strips evaporates. During evaporation, water takes heat from the body of the patient and thus the temperature of his body decreases.

29) Why does the size of naphthalene balls decrease when left open?

Ans- Naphthalene balls we use to protect woollen clothes from insects, directly changes into vapour and with time they become small in size.



30) Describe an experiment to demonstrate the process of sublimation.

Activity

Take some camphor or ammonium chloride. Powder it. Keep the powder in a china dish. Now cover the china dish with an inverted funnel. Then close the end of funnel with a piece of cotton. Now, place the dish on a wire mesh kept on a tripod stand to heat it by a burner. You will notice that the fumes of ammonium chloride are seen in the funnel above the dish. These vapours upon rising, get cooled and change to solid ammonium chloride which gets deposited on the inner walls of the funnel. Thus, ammonium chloride on heating changes directly from solid to vapour and these vapours on cooling directly change to solid ammonium chloride.