

Exercise
Heat Transfer

B) 1) What is matter & what is it composed of.

Ans Anything that has mass, occupies volume and can be felt by our senses is matter. It is composed of molecules.

2) Name the three states of matter and distinguish them on the basis of their i) volume, ii) shape.

Ans The three states of matter are:

- i) Solid
- ii) Liquid
- iii) Gaseous

Volume

Solid - They have a definite volume.

Liquid - They have a definite volume.

Gaseous - They don't have a definite volume.

Shape

Solid - They have a definite shape.

Liquid - They have no definite shape.

Gaseous - They have no definite shape.

3) Distinguish between liquid and vapour (or gas) states of matter on the basis of the following factors:

- a) Arrangement of molecules
- b) Inter-molecular separation
- c) Inter-molecular force
- d) Kinetic energy of molecules

	<u>Solid</u>	<u>Liquid</u>
Ans) a) Arrangement of molecules	Closely packed	Loosely packed
b) Intermolecular separation	Less	More
c) Intermolecular force	More	Less
d) Kinetic energy of molecules	Less	More

4) What is evaporation? Explain it on the basis of molecular motion.

Ans) The change of liquid into its vapour at all temperatures from its surface is called evaporation.

The intermolecular spaces in liquids are more and the molecular force of attraction is less which makes them move throughout the liquid.

They cannot escape the surface of liquids because of less kinetic energy, when heated they acquire sufficient kinetic energy and they overcome the attractive forces of other molecules. On escaping the molecules form the vapours of the liquid.

5) Do all molecules of liquid take part in evaporation? If not, explain your answer.

Ans No, not all molecules of liquid do not take part in evaporation, those molecules which acquire sufficient kinetic energy escape the surface by overcoming forces of attraction of other molecules. This continues till all the liquid evaporates.

6) No heat is supplied to a liquid during evaporation. How does then the liquid change into its vapour?

Ans When the molecules of liquid collide with each other they acquire kinetic energy and they

overcome the attractive forces of other molecules and change into vapours. The particles of water on the surface absorb heat from the surrounding and change into vapour.

7) Comment on the statement 'evaporation is a surface phenomenon.'

Ans Evaporation is the change of liquid into vapours at all temperatures from the surface. It takes place at surface as molecules which are at surface and gain sufficient kinetic energy from the surrounding above to ~~over~~ overcome attractive forces -

8) Why is cooling produced when a liquid evaporates?

Ans To change liquid into vapours, heat is needed which is taken from surrounding and temperature of the container or body itself falls and cooling is produced.

9) Give reason for the increase in rate of evaporation of a liquid when :-

- a) air is blown above the liquid.
- b) surface area of liquid is increased.
- c) temperature of liquid is ~~needed~~ increased.

Ans) The factors that decide the rate of evaporation are:-

- => Temperature
- => Surface area exposed
- => Partial pressure of liquid in the air above it.

a) When air is blown above the surface of liquid, it will take away the liquid carrying air particles from the air above the liquid, resulting in decrease in humidity and increase in rate of evaporation.

b) On increasing the surface area, the number of molecules in contact at the surface of liquid increased and evaporation takes place rapidly.

c) The increase in temperature increases

the kinetic energy of the molecules, they escape the force of attraction of molecules and evaporate faster.

10/ What is boiling? Explain it on the basis of molecular motion.

Ans: The change of liquid to vapour on heating at a constant temperature is called boiling.

The kinetic energy of molecules determines the molecular motion. On heating, the kinetic energy of molecules of liquid increases. These molecules start moving more rapidly and away from each other, thus, converting from liquid to gas.