Chapter 6 – Heat Transfer

A. Objective Questions

1. Write true or false for each statement

(a) Evaporation is rapid on a wet day.

Solution: False.

(b) Evaporation takes place only from the surface of liquid.

Solution: True.

(c) All molecules of a liquid take part in the process of evaporation.

Solution: False.

(d) Temperature of a liquid rises during boiling or vaporization

Solution: False.

(e) All molecules of a liquid take part in boiling.

Solution: True.

(f) Boiling is a rapid phenomenon.

Solution: True.

(g) All solids expand by the same amount when heated to the same rise in temperature.

Solution: False.

(h) Telephone wires are kept tight between the two poles in winter.

Solution: True.

(i) Equal volumes of different liquids expand by the different amount when they are heated to the same rise in temperature.

Solution: True.

(j) Solids expand the least and gases expand the most on being heated.

Solution: True.

(k) A mercury thermometer makes use of the property of expansion of liquids on heating.

Solution: True.

(l) Kerosene contracts on heating.

Solution: False.

Question 2

Fill in the blanks

(a) Boiling occurs at **a fixed temperature**.

(b) Evaporation takes place at **all temperature.**

(c) The molecules of liquid **absorb** heat from surroundings in evaporation.

(d) Heat is **absorbed** during boiling.

(e) Cooling is produced in **evaporation.**

(f) A longer rod expands **more** than a shorter rod on being heated to the same temperature.

(g) Liquids expand **more** than the solids.

(h) Gases expand more than the liquids.

(i) Alcohol expands more than water.

(j) Iron expands less than copper.

Question 3

Match the Following

Column A	**Column B**
(a) Blowing air increases	(i) increase in inter-molecular separation
(b) Increase in pressure	(ii) pendulum of a clock increases
(c) Thermal expansion	(iii) cooking utensils
(d) Invar	(iv) boiling point
(e) Pyrex glass	(v) evaporation

Solution:

Column A	**Column B**
(a) Blowing air increases	(v) evaporation
(b) Increase in pressure	(iv) boiling point
(c) Thermal expansion	(i) increase in inter-molecular separation
(d) Invar	(ii) pendulum of a clock increases
(e) Pyrex glass	(iii) cooking utensils

Question 4

Select the correct alternative

(a) In evaporation

1. all molecules of liquid begin to escape out

2. only the molecules at the surface escape out

3. the temperature of liquid rises by absorbing heat from surroundings.

4. the molecules get attracted within the liquid.

Answer: 2. only the molecules at the surface escape out

(b) The rate of evaporation of a liquid increases when:

1. temperature of liquid falls

2. liquid is poured in a vessel of less surface area

3. air is blown above the surface of liquid

4. humidity increases.

Answer: 3. air is blown above the surface of liquid

(c) During boiling or vaporization

1. all molecules take part

2. temperature rises

3. no heat is absorbed

4. the average kinetic energy of molecules increases.

Answer: 1. all molecules take part

(d) The boiling point of a liquid is increased by

1. increasing the volume of liquid

2. increasing the pressure on liquid

3. adding ice to the liquid

4. decreasing pressure on liquid.

Answer: 2. increasing the pressure on liquid

(e) Two rods A and Bof the same metal, but of length 1 m and 2 m respectively, are heated from 0°C to 100°C. Then

1. both the rods A and B elongate the same

2. the rod A elongates more than the rod B

3. the rod B elongates more than the rod A

4. the rod A elongates, but the rod B contracts.

Answer: 3. the rod B elongates more than the rod A

(f) Two rods A and B of the same metal, same length, but one solid and the other hollow, are heated to the same rise in temperature. Then

1. the solid rod A expands more than the hollow rod B

2. the hollow rod B expands more than the solid rod A

3. the hollow rod B contracts, but the solid rod A expands

4. both the rods A and B expand the same.

Answer: 4. both the rods A and B expand the same.

(g) A given volume of alcohol and the same volume of water are heated from the room temperature to the same temperature then.

1. alcohol contracts, but water expands

2. water contracts, but alcohol expands

3. water expands more than alcohol

4. alcohol expands more than water.

Answer: 4. alcohol expands more than water.

(h) The increase in length of a metal rod depends on

1. the initial length of the rod only

2. the rise in temperature only

3. the material of rod only

4. all the above three factors.

Answer: 4. all the above three factors.

(i) The correct statement is

1. Iron rims are cooled before they are placed on the cart wheels.

2. A glass stopper gets tighten on warming the neck of the bottle.

3. Telephone wires sag in winter, but become tight in summer.

4. A little space is left between two rails on a railway track.

Answer: 4. A little space is left between two rails on a railway track.