Transmission of Heat

Solution 1.a:
The process of conduction takes place only in solids. In solids, the particles are closely packed together. During conduction, heat is transferred from one particle to another by back and forth vibrations of particles. Hence, for conduction, particles are necessary, and for which a medium is necessary. Thus, a medium is necessary for conduction.

Solution 1.b:
The upper layers of water in a pond are warmer because they are exposed to the Sun and the heat escapes into the air in the form of vapour because of convection current. This shows that convection current always travels upwards.

Solution 1.c:
We feel warm near a bonfire because of radiation.
A hot object emits heat in all the directions. So, a bonfire also emits heat in all directions. Some of the heat is absorbed by our body, and hence, we feel warm.

Solution 1.d:
Radiation is thwarted by the shiny surfaces in a thermos flask.

Solution 2:
(a) During conduction, particles of the substance do not leave their place.
(b) In a convection current, warm air travels upwards.
(c) Copper is a better conductor of heat than iron.

Solution 3.a:
The table lamp emits heat when it is switched on. This heat is radiated from all sides of the lamp. Most of the heat of a table lamp is carried upward in the atmosphere because of convection current, but we feel the heat of a table lamp under it as our body absorbs the radiated heat.

Solution 3.b:
The well has a smaller surface because of which it absorbs less amount of heat which is radiated from the Sun. The pond surface is large, so it absorbs more heat because of a larger surface area. Hence, the upper layers of water in a deep well are cool, but those in a pond are warm.

Solution 3.c:
Sawdust is a bad conductor of heat because heat travels very slowly from it.

Solution 4:
The water in a pressure cooker on the gas burner is heated for some time and blows a

whistle. Hot water contains some energy, but it is not sufficient for the weight to be lifted. However, when water is converted into steam, the weight of the pressure cooker increases because of heat. This tells us that heat is a form of energy.

Solution 5:

Group 'A'	Group 'B'
(a) Good conductor	Copper
(b) Bad conductor	Glass
(c) Vibration	Conduction
(d) A rotating paper lantern	Convection current

Solution 6:

1. True
2. False. In a thermos flask, hot things remain hot and cold things remain cold for a long time.
3. True
4. False. Radiation takes place without any medium. During conduction, the particles of a medium vibrate.