

Thermometer is a device used for measuring temperature.

Clinical thermometer is used to measure our body temperature. The range of this thermometer is from  $35^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ . For other purposes, we use the laboratory thermometers. The range of these thermometers is usually from  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ .

The normal temperature of the human body is  $37^{\circ}\text{C}$ .

The heat flows from a body at a higher temperature to a body at a lower temperature. There are three ways in which heat can flow from one object to another. These are conduction, convection and radiation.

In solids, generally, the heat is transferred by conduction. In liquids and gases the heat is transferred by convection. No medium is required for transfer of heat by radiation.

The materials which allow heat to pass through them easily are conductors of heat.

The materials which do not allow heat to pass through them easily are called insulators.

Dark-coloured objects absorb more heat than the light-coloured objects. That is the reason we feel more comfortable in light-coloured clothes in the summer.

Woollen clothes keep us warm during winter. It is so because wool is a poor conductor of heat and it has air trapped in between the fibres.

## Exercises

1. State similarities and differences between the laboratory thermometer and the clinical thermometer.
2. Give two examples each of conductors and insulators of heat.
  - (a) The hotness of an object is determined by its temperature.
  - (b) Temperature of boiling water cannot be measured by a clinical thermometer.
  - (c) Temperature is measured in degree celcius.
3. Fill in the blanks :
  - (a) The hotness of an object is determined by its temperature.
  - (b) Temperature of boiling water cannot be measured by a clinical thermometer.
  - (c) Temperature is measured in degree celcius.

- (d) No medium is required for transfer of heat by the process of Radiation
- (e) A cold steel spoon is dipped in a cup of hot milk. Heat is transferred to its other end by the process of conduction
- (f) Clothes of dark colours absorb more heat better than clothes of light colours.

4. Match the following :

- |  |                |
|--|----------------|
| (i) Land breeze blows during                     | (a) summer (4) |
| (ii) Sea breeze blows during                     | (b) winter (3) |
| (iii) Dark coloured clothes are preferred during | (c) day (2)    |
| (iv) Light coloured clothes are preferred during | (d) night (1)  |
5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing .
6. Look at Fig. 4.13. Mark where the heat is being transferred by conduction, by convection and by radiation.



**Fig. 4.13**

7. In places of hot climate it is advised that the outer walls of houses be painted white. Explain.
8. One litre of water at  $30^{\circ}\text{C}$  is mixed with one litre of water at  $50^{\circ}\text{C}$ . The temperature of the mixture will be
- |                          |   |
|--------------------------|---|
| (a) $80^{\circ}\text{C}$ | (b) more than $50^{\circ}\text{C}$ but less than $80^{\circ}\text{C}$ |
| (c) $20^{\circ}\text{C}$ | (d) between $30^{\circ}\text{C}$ and $50^{\circ}\text{C}$             |



9. An iron ball at  $40^{\circ}\text{C}$  is dropped in a mug containing water at  $40^{\circ}\text{C}$ . The heat will
- (a) flow from iron ball to water.
  - (b) not flow from iron ball to water or from water to iron ball.
  - (c) flow from water to iron ball.
  - (d) increase the temperature of both.
10. A wooden spoon is dipped in a cup of ice cream. Its other end
- (a) becomes cold by the process of conduction.
  - (b) becomes cold by the process of convection.
  - (c) becomes cold by the process of radiation.
  - (d) does not become cold.
11. Stainless steel pans are usually provided with copper bottoms. The reason for this could be that
- (a) copper bottom makes the pan more durable.
  - (b) such pans appear colourful.
  - (c) copper is a better conductor of heat than the stainless steel.
  - (d) copper is easier to clean than the stainless steel.