Heat

1. **State similarities and differences between the laboratory thermometer and the clinical thermometer.**

Answer:

Similarity:

- The clinical as well as the laboratory thermometer is used to measure the temperature of a body or object.
- Both the thermometers have glass tube with bulb containing mercury.
- They can measure temperature in degree Celsius.

Differences

- A clinical thermometer is used for measuring the human body temperature while a laboratory thermometer measures temperature of other objects.
- The scale range of a clinical thermometer is from 35 °C to 42 °C and the range of a laboratory thermometer is generally from –10°C to 110°C.
- A clinical thermometer has a kink to prevent mercury from being fallen back on of its own where as a laboratory thermometer does not have one.
- A laboratory thermometer should be kept upright not tilted for taking temperature reading.

2. **Give two examples each of conductors and insulators of heat.**

Answers:

Conductors – Iron, Copper
Insulators – Rubber, Plastic

3. **Fill in the blanks:**

(a) The hotness of an object is determined by its _____.
(b) Temperature of boiling water cannot be measured by a _____ thermometer.
(c) Temperature is measured in degree _____.

(d) No medium is required for transfer of heat by the process of _____.

(e) A cold steel spoon is dipped in a cup of hot milk. It transfers heat to its other end by the process of _____.
(f) Clothes of _____ colours absorb heat better than clothes of light colours.

Answers:

(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 **Celsius**.

(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. It transfers heat to its other end by the process of **conduction**.
(f) Clothes of **dark** colours absorb heat better than clothes of light colours.

4. Match the following:

(i) Land breeze blows during	(c) day
(ii) Sea breeze blows during	(d) night
(iii) Dark coloured clothes are preferred during	(b) winter
(iv) Light coloured clothes are preferred during	(a) summer

Answer:

(i) Land breeze blows during	(a) night
(ii) Sea breeze blows during	(b) day
(iii) Dark coloured clothes are preferred during	(c) winter
(iv) Light coloured clothes are preferred during	(d) summer

5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing.

Answer:

If we wear more layers of clothing during winters, it keeps us warm. This is because wool is a poor conductor of heat and traps the hot air in between the fibres due to which we feel warm. On the other hand just one thick piece of clothing would trap lesser amount of heat in comparison to more layers.

6. Look at Fig. 4.13. Mark where the heat is being transferred by conduction, by convection and by radiation.

Fig. 4.13

Answer:

Water inside the pan is getting heat through convection.
Heat is being transferred through Steel body of pan by conduction.
Steel Pan is getting heat from burner through Radiation

7. In places of hot climate it is advised that the outer walls of houses be painted white. Explain.

Answer:

Light colours reflects back maximum amount of heat and absorbs less hence it is advised to paint the outer walls of the houses white so that house remains cool from the heat coming from outside.

8. One liter of water at 30°C is mixed with one liter of water at 50°C. The temperature of the mixture will be

(a) 80°C
(b) more than 50°C but less than 80°C
(c) 20°C

(d) between 30°C and 50°C

Answer:

(d) between 30°C and 50°C

9. An iron ball at 40°C is dropped in a mug containing water at 40°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.

Answer:

(b) not flow from iron ball to water or from water to iron ball.

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.

Answer:

(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.

Answer:

(c) copper is a better conductor of heat than the stainless steel.