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## Heat

## Que 1. State similarities and differences between the laboratory thermometer and the clinical thermometer.

#### Similarities:

- Both are used to measure temperature.
- Both contain mercury and have a glass tube with a scale.

#### Differences:

Feature	Clinical Thermometer	Laboratory Thermometer
Use	Used to measure human body temperature	Used to measure temperature of other substances
Range	35°C to 42°C	–10°C to 110°C
Kink	Has a kink to prevent mercury from falling back	No kink
Reading	Can be read after removal from the body	Must be read while in the substance

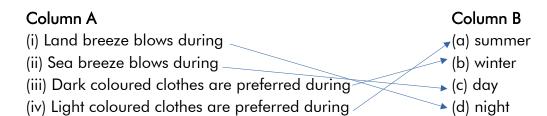
## Que 2. Give two examples each of conductors and insulators of heat.

Conductors: Copper, IronInsulators: Plastic, Wood

#### Que 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 <u>clinical</u> thermometer.
- (c) Temperature is measured in degree <u>Celsius</u>.
- (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 <u>dark colours</u> absorb more heat better than clothes of light colours.

## Que 4. Match the following



## Que 5. Why wearing more layers of clothing during winter keeps us warmer than one thick piece of clothing?

Answer: More layers trap air between them. Since air is a poor conductor of heat, it prevents the loss of heat from the body and keeps us warmer.

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



Conduction: Heat transfer from the flame to the pan through the metal base.

Convection: Heat circulation in water inside the pan.

Radiation: Heat coming from the flame to the pan and surrounding air without touching (in the form of rays).

### Que 7. Why is it advised that the outer walls of houses be painted white in hot climates?

Answer: White reflects most of the heat from sunlight and absorbs very little. This helps in keeping the house cooler in hot climates.

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

Answer: (d) between 30°C and 50°C

## Que 9. An iron ball at 40°C is dropped in water at 40°C. The heat will

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

#### Que 10. A wooden spoon is dipped in ice cream. Its other end

Answer: (d) does not become cold. (Because wood is an insulator and does not allow heat to transfer easily.)

## Que 11. Stainless steel pans are usually provided with copper bottoms because

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

### Extended Learning – Activities and Answers

#### 1. Observation at the Doctor's Clinic

- (a) The thermometer is dipped in a liquid (usually antiseptic) to clean and disinfect it.
- (b) It is kept under the tongue because it provides a close estimate of the core body temperature.
- (c) Yes, but other places like the armpit may not give accurate readings.
- (d) No, the temperature of different parts of the body may differ slightly.

### – Why is digital thermometer preferred today?

Answer: Digital thermometers are safer (no mercury), more convenient (digital display - easy and accurate to read), and environmentally friendly compared to mercury thermometers

## 2. Observation at the Veterinary Clinic

Normal temperature of domestic animals:

Cow: Around 38.6°C to 39.3°C Dog: Around 38.3°C to 39.2°C Cat: Around 38.6°C to 39.2°C

Birds (e.g. hens): Around 40°C to 43°C

### 3. Paper strip activity around iron rod

#### Observation:

The paper does not burn while rotating the rod.

#### **Explanation:**

The heat is spread over a large area due to rotation, and no single point gets hot enough to ignite the paper.