**Question Bank: Temperature and Heat**

**Chapter: Temperature and Heat**
**Class: 6 | Science | Oxford Curriculum**
**Total Questions: 25**
**Mapped with Bloom's Taxonomy**
**Competitive Exam Tags: NTSE, NSO, NSTSE**

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## Section A: Remembering & Understanding (1 Mark Each)

1. What is the SI unit of temperature?
   **Answer:** The SI unit of temperature is Kelvin (K). However, in daily life, Celsius (°C) is more commonly used for measuring temperature.
   *Tag: NTSE*

2. Define heat.
   **Answer:** Heat is a form of energy that is transferred between two bodies due to a difference in their temperature.
   *Tag: NSO*

3. What instrument is used to measure temperature?
   **Answer:** A thermometer is used to measure temperature. Common types include clinical and laboratory thermometers.
   *Tag: NSTSE*

4. Name the thermometer used to measure body temperature.
   **Answer:** Clinical thermometer.
   *Tag: NSO*

5. What is the normal body temperature of a human being?
   **Answer:** 37°C or 98.6°F
   *Tag: NTSE*

6. Define temperature.
   **Answer:** Temperature is the measure of the degree of hotness or coldness of an object.
   *Tag: NSO*

7. What is the boiling point of water in Celsius?
   **Answer:** 100°C
   *Tag: NSO*

8. What is the freezing point of water in Celsius?
   **Answer:** 0°C
   *Tag: NTSE*

9. Which liquid is used in clinical thermometers?
   **Answer:** Mercury is used because it expands uniformly and is visible in the capillary tube.
   *Tag: NSTSE*

10. What is conduction?
    **Answer:** Conduction is the transfer of heat from a hotter object to a colder one through direct contact.
    *Tag: NSO*

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## Section B: Applying & Analyzing (2–3 Marks Each)

1. Why should we not use a clinical thermometer to measure the temperature of boiling water?
   **Answer:** Clinical thermometers are designed for body temperatures, which range from 35°C to 42°C. Boiling water is at 100°C, which can break or damage the thermometer.
   *Tag: NTSE*

2. How is a laboratory thermometer different from a clinical thermometer?
   **Answer:** A laboratory thermometer measures a wide range of temperatures and has a long stem without a kink. A clinical thermometer has a narrow range (35°C to 42°C) and has a constriction to prevent mercury from falling quickly.
   *Tag: NSO*

3. Why is mercury preferred in thermometers?
   **Answer:** Mercury is shiny, does not stick to the glass, expands uniformly with temperature, and is visible, making it ideal for precise readings.
   *Tag: NSTSE*

4. How does heat transfer in solids differ from gases?
   **Answer:** In solids, heat is transferred mainly by conduction, through particle vibration. In gases, it transfers via convection, where particles move and carry heat with them.
   *Tag: NTSE*

5. What precautions should be taken while using a clinical thermometer?
   **Answer:** Always shake the thermometer to bring the mercury below 35°C before use, place it under the tongue, wait for one minute, and handle it carefully to avoid breakage.
   *Tag: NSO*

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## Section C: Evaluating & Creating (3–5 Marks Each)

1. Explain three methods of heat transfer with suitable examples.
   **Answer:**
2. **Conduction**: Heat transfer through solids. Example: Heating a metal rod.
3. **Convection**: Transfer through liquids and gases. Example: Boiling water circulates heat.

4. **Radiation**: Heat transfer without a medium. Example: Heat from the Sun. These three processes are essential for understanding how heat travels in various environments.
   *Tag: NTSE*

5. Describe the working of a clinical thermometer and how to use it safely.
   **Answer:** A clinical thermometer consists of a glass tube with mercury inside. When placed under the tongue, the mercury expands and rises in the capillary. The constriction prevents it from falling immediately, allowing easy reading. After use, it must be disinfected and stored properly.
   *Tag: NSO*

6. How does heat affect the state of matter? Explain with two examples.
   **Answer:** Heat can change the state of matter. For example:

7. Ice (solid) melts into water (liquid) on heating.

8. Water (liquid) boils into steam (gas) at 100°C. Heat provides the energy required for molecules to overcome their bonding forces and change state.
   *Tag: NSTSE*

9. A metal rod is heated at one end. Describe how the heat travels to the other end.
   **Answer:** In solids like metal rods, heat transfers by conduction. The particles at the heated end vibrate faster, transferring energy to adjacent particles. This continues along the rod until heat reaches the other end.
   *Tag: NSO*

10. Compare the structure and use of a laboratory thermometer and a clinical thermometer in tabular form.
    **Answer:**

| Feature | Clinical Thermometer | Laboratory Thermometer |
|---|---|---|
| Range | 35°C to 42°C | -10°C to 110°C |
| Kink Present | Yes | No |
| Used For | Measuring body temp. | Measuring other temps |
| Mercury Thread Stays | Yes (due to kink) | No |
| Durability | Fragile | More robust |

*Tag: NTSE*

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## Section D: Case-Based/Scenario Questions (4–5 Marks Each)

1. **Case Study:** In a science lab, two students measured the temperature of hot water using a clinical thermometer. After inserting it, the thermometer broke and mercury spilled. a) What went wrong in the experiment?

b) What safety measures should be taken during such experiments?
**Answer:** a) Clinical thermometers are not suitable for high temperatures like hot water. The thermometer broke due to excessive heat. b) Always use laboratory thermometers for such tasks. Wear gloves, handle glassware carefully, and avoid direct contact with mercury. Mercury spills are toxic and must be cleaned with expert help.
*Tag: NTSE*

2. **Scenario:** Ramesh left his thermometer in the sun. Later, he used it to measure his temperature and was alarmed to find it showed 40°C. a) What mistake did Ramesh make?
   b) What does this teach about handling thermometers?
   **Answer:** a) Ramesh did not reset or cool the thermometer before using it, leading to a false reading. b) Thermometers must be shaken before use and not exposed to heat sources. Always ensure correct pre-use preparation for accuracy.
   *Tag: NSTSE*

3. **Case Study:** A classroom has metal chairs and wooden benches. On a cold morning, students noticed the metal felt colder than the wood, though both were in the same room. a) Why does metal feel colder than wood?
   b) What principle of heat transfer explains this observation?
   **Answer:** a) Metal is a good conductor of heat and draws heat quickly from our skin, making it feel colder. b) This is due to conduction. Wood is a poor conductor, so it does not draw heat as quickly.
   *Tag: NSO*

4. **Scenario:** During an experiment, Ria observed that when she heated a beaker of water, the bottom became hot first, and bubbles formed and rose. a) What type of heat transfer was involved?
   b) Explain why the bubbles rise.
   **Answer:** a) Convection. b) Hot water becomes less dense and rises, carrying heat upwards. The bubbles are formed by heated air or water vapor and follow this upward flow.
   *Tag: NSO*

5. **Case Study:** Students were asked to design a solar cooker. They used a box painted black inside and placed it under the sun with a glass cover. a) Why was black paint used?
   b) How does the solar cooker trap heat?
   **Answer:** a) Black surfaces absorb more heat from sunlight. b) The glass cover allows sunlight in but prevents heat from escaping, creating a greenhouse effect that increases the temperature inside the cooker. This setup uses radiation to cook food.
   *Tag: NTSE*