Transfer of Heat

A. Choose the Correct Answer:

1. Which method of heat transfer occurs in solids mainly through direct contact of particles?

A) Conduction B) Convection
C) Radiation D) Evaporation

2. Which of the following is an example of convection?

A) Heat traveling through a metal rod
B) Sunlight warming the Earth
C) Boiling water in a pot
D) Heating an iron rod in a flame

3. Why do metals feel colder than wood at room temperature?

A) Metals absorb more heat from the surroundings
B) Metals conduct heat away from the hand faster
C) Wood has a lower temperature than metal
D) Wood is a better conductor than metal

B. Fill in the Blanks

1. Heat transfer through direct contact of particles in a solid is called _____.
2. The process by which heat is transferred through liquids and gases due to movement of molecules is known as _____.
3. _____ is the only mode of heat transfer that does not require a medium.

C. Case Study

A scientist, Dr. Mehra, conducted an experiment to study heat transfer in different materials. She placed a metal rod, a plastic rod, and a wooden rod in boiling water. After a few minutes, she touched each rod at the opposite end and recorded her observations:

- The metal rod felt very hot.
- The wooden rod remained relatively cool.
- The plastic rod became warm but not as hot as the metal rod.

Dr. Mehra concluded that different materials conduct heat at different rates.

Case Study Questions:

1. What was Dr. Mehra trying to study in her experiment?
2. Why did the metal rod feel hotter than the wooden and plastic rods?
3. What property of wood makes it a poor conductor of heat?
4. Based on this experiment, why are cooking utensils often made of metal but have wooden or plastic handles?

D. Short Answer Questions

1. What are the three modes of heat transfer?
2. Why do we wear woolen clothes in winter?
3. Why does a black surface absorb more heat than a white surface?

E. Long Answer Questions

1. Explain the process of conduction, convection, and radiation with suitable examples.
2. Describe the role of insulators and conductors in daily life and their importance in various applications.
3. How does heat transfer occur in the atmosphere, and what role does it play in weather and climate?