

CHAPTER - 2

HEAT TRANSFER IN NATURE

NCERT FOLDER

I VERY SHORT ANSWER TYPE :

② Why is the handle of a kettle is covered with plastic?

- i) Plastic is a very poor conductor of heat.
- ii) It keeps the handle cool to the touch.
- iii) It allows safe lifting of the hot kettle.

④ What is thermal energy?

Thermal energy is the internal kinetic energy of an object due to the random motion of its atoms and molecules. It is felt as heat.

⑤ How does in conduction occurs in only solids?

In solids, particles are tightly packed in a fixed lattice. They cannot move freely but transfer heat by vibrating and colliding with neighboring particles.

⑧ Give me a short note on convection.

Convection is the mode of heat transfer in fluids (liquids and gases) where the heated particles physically move from warmer regions to cooler regions, creating convection.

currents.

(10) without touching we can feel the heat. How?
we feel heat without touching through the process of radiation. Heat is transferred via electromagnetic waves (Infrared rays) which do not require any physical contact or medium.

(14) Give me a note on infiltration and percolation?
Infiltration: This is the initial process where water on the ground surface enters into the soil.

Percolation: This is the downward movement of water through the deeper layers of soil and rock strata until it reaches the ground water table.

II SHORT ANSWER TYPE:

(1) Write the differences between conduction, convection and radiation.

Conduction: Heat transfers through direct contact without particle movement. It occurs mainly in solids.

Convection: Heat transfers through the actual movement of particles. It occurs only in fluids.

Radiation: Heat transfers through electromagnetic waves. It requires no material medium to travel.

② What do you mean by conduction mode of transfer of heat energy?

i) Heat flows from hotter regions to colder regions.

ii) It requires direct physical contact.

iii) Thermal energy passes through atomic or molecular vibrations.

iv) The material particles do not change their position.

⑨ How does the water cycle help in maintaining groundwater levels?

i) Precipitation falls onto the ground as rain or snow.

ii) Water filters down into the soil via infiltration and percolation.

iii) This downward moving water continuously recharges underground aquifers.

⑩ Why do clouds form when warm moist air rises high into the atmosphere?

As warm, moist air rises, it encounters lower atmospheric pressure, causing it to expand and cool down. Once the air cools to its dew point, it can no longer hold all its water vapour. The vapour undergoes condensation, turning into tiny water

droplets or ice crystals around airborne dust particles to form clouds.

III LONG ANSWER TYPE:

- ① Explain the process of conduction of heat with a suitable activity or example.

Conduction is the transfer of heat from a hotter part of a colder part of an object through direct particle contact, without the actual movement of the particles themselves. It happens mostly in solids.

Example:

When you place a metal spoon in a hot cup of a tea, the handle soon becomes hot.

- ② Describe the process of convection in liquids and gases support your answer with an activity

When a fluid is heated, it expands, becomes lighter, and rises. The cooler, denser fluid from the top moves down to take its place. This creates a continuous loop called a convection current.

Activity:

i) Fill a round-bottom flask with water and place a crystal of potassium permanganate at the bottom.

ii) Heat the flask gently from the bottom

using a burner.

iii) Observation: you will see purple streaks of water rising up from the bottom and then moving down along the sides of the flask. This visually shows the convection currents setup in the liquid.

③ What is radiation? How is it different from conduction and convection? Give examples

Radiation is the mode of heat transfer that does not require any material medium (like a solid, liquid or gas) to travel. It can take place through a vacuum.

Differences:

Conduction	Convection	Radiation
It requires a solid medium, particles do not move.	It requires a liquid or gas medium, particles physically move.	It requires no medium at all, heat travels via electromagnetic waves at the speed of light.

Examples:

i) The heat from the sun reaching the Earth through the vacuum of space.

ii) Feeling warmth when sitting near a campfire or an electric room heater.

⑥ How do heat transfer processes [conduction, convection, radiation] play a role in everyday life? Give examples.

conduction:

When you cooking food, cooking utensils are made of metals (like copper or aluminium) so heat transfers easily from the stove to the food. Their handles are made of plastic or wood (Insulators) to prevent burning our hands.

convection:

Used in room ventilation and heating, Air conditioners are mounted near the ceiling because cold air is dense and sinks down to cool the room. Room heaters are placed on the floor because warm air rises up to warm the room.

Radiation:

Keeps up warm, we wear dark-colored clothes in winter because they absorb more radiant heat from the sun, keeping us cozy. White roofs or houses reflect solar radiation to stay cool in summer.