INDIAN SCHOOL AL WADI AL KABIR

CLASS: VII	**DEPARTMENT: SCIENCE 2026 - 27**	**DATE: 07/05/2026**
WORKSHEET NO: 3 WITH ANSWERS	**TOPIC: HEAT TRANSFER IN NATURE**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE-TYPE QUESTIONS:

1. At a campsite, there are three tents made of different fabrics: one black, one white, and one with a mix of black and white. If you want to rest on a hot summer afternoon, which tent would you choose?
   (a) Black fabric
   (b) Black and white combination
   (c) White fabric
   (d) All of these are equally suitable
2. Which of the following represents the correct sequence of processes in the water cycle?
   (a) Condensation → Precipitation → Evaporation → Cloud formation
   (b) Evaporation → Condensation → Cloud formation → Precipitation
   (c) Cloud formation → Evaporation → Precipitation → Condensation
   (d) Evaporation → Precipitation → Condensation → Cloud formation
3. In coastal regions during the day, uneven heating of land and sea leads to air movement known as a sea breeze. Which natural processes cause this movement of air?
   (a) Warm air from the sea is radiated upwards and cold air rushes in, creating a sea breeze.
   (b) Warm air from land rises by convection, and cold air fills its place, as a sea breeze.
   (c) Warm air from the sea is conducted to the air and cold air rushes in, creating a land breeze.
   (d) Warm air from land and warm air from sea both rise and are cooled by insulation.
4. In Ladakh, water freezes into cone-shaped ice stupas during winter when sprayed into cold air. These structures melt slowly in spring and provide water when streams dry up. Why are ice stupas useful?

(a) Store liquid water in winter

(b) Increase temperature

(c) Stop evaporation

(d) Provide water in spring and summer

5. A farmer observes that rainwater disappears quickly in a gravel area but remains on the surface for a long time in a clay-rich field. What is the most appropriate explanation for this observation?

   (a) Gravel has very large spaces that allow water to pass quickly through it

   (b) Clay produces additional water that slows down the movement of water

   (c) Sand completely blocks water from entering the ground surface

   (d) Gravel absorbs water chemically and stores it inside particles

6. Why are metal utensils used for cooking, while clay or porcelain cups are preferred for drinking hot beverages?

   (a) Metals conduct heat quickly, and clay reduces heat transfer to the hands

   (b) Metals cool food rapidly, and clay increases heat transfer to the hands

   (c) Metals block heat flow completely, and clay allows rapid heat flow

   (d) Metals change heat into light, and clay changes heat into sound

7. In a rapidly growing city, excessive use of groundwater and reduced vegetation cover have led to declining water levels underground. Concrete surfaces have further reduced the natural soaking of rainwater into the ground. To improve the situation, methods like rainwater harvesting and recharge pits are being used. What is the main purpose of these methods?

   (a) To increase surface water pollution

   (b) To reduce rainfall in urban areas

   (c) To help restore underground water levels

   (d) To stop the flow of water into rivers

For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below -

(A) Both A and R are true, and R is the correct explanation of the assertion.

(B) Both A and R are true, but R is not the correct explanation of the assertion.

(C) A is true, but R is false.

(D) A is false, but R is true.

8. **Assertion (A):** Pins attached with wax to a heated metal strip fall one by one as heat travels along the strip.

   Reason (R): Wood and glass are poor conductors of heat, so they do not allow heat to pass through easily.

9. **Assertion (A):** The water cycle helps in conserving and redistributing water on Earth.

   Reason (R): Rainwater collects in rivers, lakes, and oceans or seeps into the ground after falling on the Earth's surface.

10. **Assertion (A):** The cup placed above the burning candle goes down due to the heat.

    Reason (R): Warm air expands, becomes lighter, and rises upward.

II. VERY SHORT ANSWER TYPE QUESTIONS (2 M):

1. How does the rate of seepage vary in different types of soil — gravel, sand and clay? Explain.

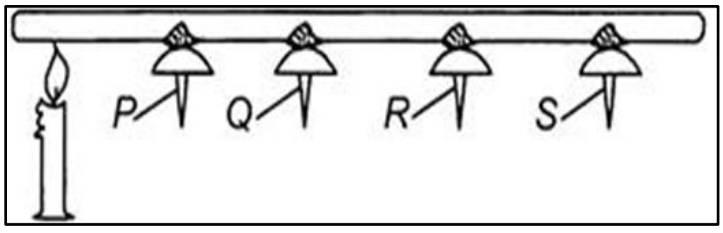
   [Hint: The rate of seepage is fastest in gravel because the spaces between its particles are large and well-connected.

   It is slower in sand, as the spaces are smaller, and slowest in clay, where the particles are very fine and tightly packed, allowing very little water to pass through.]

2. Using two thin blankets rather than one thick blanket is preferred. Explain.

   [Hint: The two thin blankets joined together will have a layer of air trapped in between them. Air doesn't allow our body heat to escape to the cold surroundings and hence keeps us warm.]

3. Some pins are stuck to a metal rod with wax, and a lighted candle is kept below the rod as shown in the diagram below:



   Which one of the pins will fall off the metal rod first? Give a reason.

   [Hint: The pin 'P' nearest to the flame falls first because heat is transferred from the hot end of the metal rod to its colder end by the process of conduction.]

4. Why does warm air rise while cool air sinks?

[Hint: Warm air becomes lighter and less dense, so it rises. Cool air is heavier and denser, so it sinks — this movement forms convection currents.]

5. State the difference between conductors and insulators of heat, and give suitable examples for each.

   [Hint: <u>Conductors</u> – The materials which allow heat to pass through them easily.
   e.g. Iron and Copper
   <u>Insulators</u> – Materials that do not allow heat to pass through them easily.
   e.g., wood and plastic]

III. <u>SHORT ANSWER TYPE QUESTIONS (3M):</u>

1. How does the process of heat transfer play an important role in driving and maintaining the water cycle on Earth?

   [Hint: Sun's rays heat surface water, causing evaporation. The water vapour rises, cools, and condenses to form clouds. Convection currents in air help distribute moisture, leading to rainfall — all processes driven by heat transfer.]

2. <u>Give reason:</u>

   a) Hollow bricks are used in the construction of the outer walls of houses. (WBQ)

   [Hint: Hollow bricks trap air inside, which is a poor conductor of heat. This helps to keep the house cool in summer and warm in winter, making the building more comfortable to live in.]

   b) The handle of a pressure cooker is covered with thick plastic.

   [Hint: Plastic is a bad conductor of heat, due to which the heat from the cooker does not flow to its handle, and we can hold it easily.]

   c) In places of hot climate, it is advised that the outer walls of houses be painted white.

   [Hint: In places with a hot climate, it is advised that the outer walls of houses be painted white because:

   - **White colour reflects most of the heat that falls on it, instead of absorbing it.**
   - **This helps to keep the interior of the house cooler, even during high temperatures.]**

3. How does wearing multiple layers of clothing keep us warmer? (WBQ)

   [Hint: Wearing multiple layers traps air between each layer, and air being an insulator, prevents body heat from escaping. Each layer reduces the loss of heat,

keeping us warmer than one thick layer. This method is especially effective in cold climates.]

4. Explain any two applications of convection and radiation that we observe in our daily life, with suitable examples.

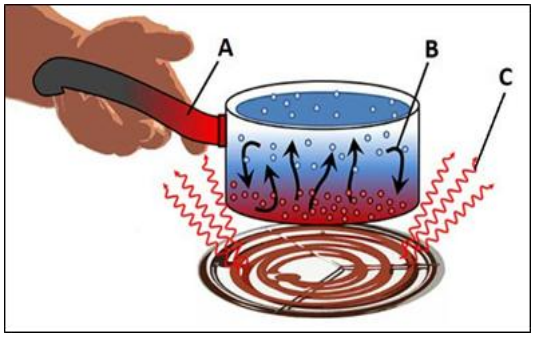
   [Hint: <u>Convection</u> – i) Room heater warms the air near the floor. When the warm air rises up, the cool air sinks to the floor, which results in effective heating of the room.

   ii) Exhaust fans are fitted near the ceiling for hot air to escape.

   <u>Radiation</u> – i) In cold and hilly areas, the outer walls and roofs are usually painted dark to keep the houses warm,

   ii) During summer, we feel comfortable wearing light-coloured clothes. In winter, wearing dark-coloured clothes keeps our bodies warm. This is because light colours are poor absorbers of heat and dark colours are good absorbers.]

5. Observe the figure given below, identify A, B and C and explain each of them.



   [Hint: A – <u>CONDUCTION</u>: The process by which heat is transferred from the hotter end to the colder end of an object without actual movement of particles.

   B – <u>CONVECTION</u>: The method in which heat is transferred by the actual movement of the particles of a substance.

   C – <u>RADIATION</u>: It is a process of heat transfer which does not require any material medium.]

IV. <u>LONG ANSWER TYPE QUESTIONS (5M):</u>

1. Describe how ice stupas are designed in Ladakh to preserve water. (WBQ)

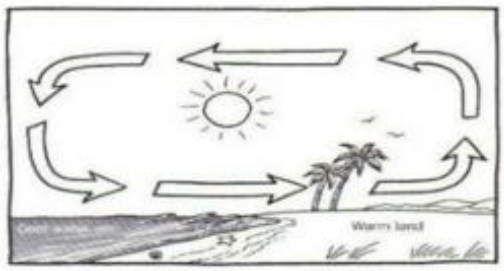
   [Hint: Ice stupas are artificial glaciers designed to store water during winter and release it in spring for farming.

   <u>Process:</u> • Water is piped from higher altitudes and sprayed upward during freezing temperatures.

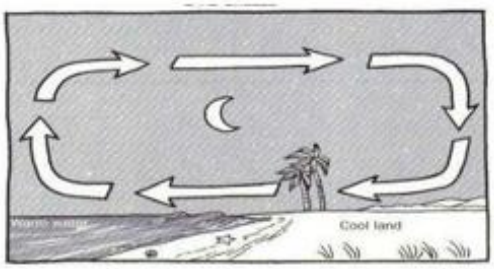
• The water freezes into a cone-shaped ice tower (stupa).

• In warmer months, the ice slowly melts, supplying water when it is most needed.]

2. Explain the differences between sea breeze and land breeze with the help of labelled diagrams.



SEA BREEZE



LAND BREEZE

[Hint: *SEA BREEZE* - During the day, the land heats up much faster than seawater. So, the air above the land becomes hotter and rises. The cool air above the sea surface moves towards land to fill the space. This flow of air from the sea towards the land is called sea breeze.

***LAND BREEZE* – The land cools much faster at night than the seawater. So, the air above the land surface is cooler than the air over the sea. The warm air above the sea surface rises. The cool air from the land moves towards the sea. This flow of air from land towards the sea is called a land breeze.]**

V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

Read the passage and answer the following questions:

Water moves through soil at different speeds. It seeps fastest through gravel, slower through sand, and slowest through clay because gravel has larger spaces between its particles. The movement of water from the surface into the ground is called infiltration. Water infiltrates more easily when soil particles have wide, open, and connected spaces.

This water gets stored underground in spaces between rocks and soil. These water-storing layers are called aquifers. People obtain this groundwater by digging wells or drilling bore wells. However, groundwater is limited and is being overused due to increasing population, reduced vegetation, and more concrete surfaces in cities, which reduce infiltration.

To replenish groundwater, methods like rainwater harvesting and recharge pits are used. In some places, like Ladakh, people also use ice stupas to store water during winter for use in dry seasons.

i) What is infiltration? **[Hint: Infiltration is the process by which water from the surface seeps into the soil and moves down into rocks beneath the ground.]**

ii) Why does water seep faster through gravel than through clay?
[Hint: Water seeps faster through gravel because the spaces between its particles are larger and more open than in clay.]

iii) What are aquifers? **[Hint: Aquifers are underground layers of soil and rock that store water in their pore spaces.]**

iv) How can groundwater be recharged?
[Hint: Groundwater can be recharged through rainwater harvesting, recharge pits, and natural infiltration of rainwater into the ground.]

ANSWERS FOR OBJECTIVE TYPE QUESTIONS [1 to 10] –

1 – (c) White fabric

2 – (b) Evaporation → Condensation → Cloud formation → Precipitation

3 – (b) Warm air from land rises by convection, and cold air fills its place, as a sea breeze

4 – (d) Provide water in spring and summer

5 – (a) Gravel has very large spaces that allow water to pass quickly through it

6 – (a) Metals conduct heat quickly, and clay reduces heat transfer to hands

7 – (c) To help restore underground water levels

8 – (B) Both A and R are true, but R is not the correct explanation of the assertion.

9 – (A) Both A and R are true, and R is the correct explanation of the assertion.

10 - (D) A is false, but R is true.

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