INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VII	**DEPARTMENT: SCIENCE 2020 -2021**	**DATE OF SUBMISSION** **07.05.2020**
WORKSHEET NO.: 2 **WITH ANSWERS**	**Topic: HEAT**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS:

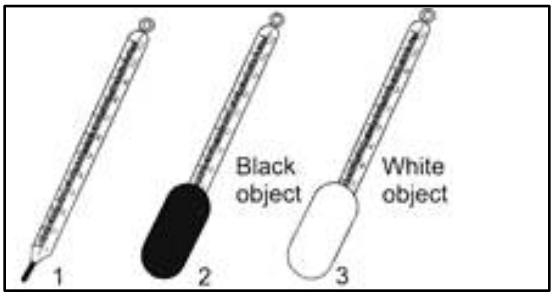
1. Heat always flows –

   a] From colder body to a hotter body
   b] From hotter body to a colder body
   c] In both the directions
   d] Never flows from one body to other

2. The normal temperature of a healthy human body is –

   a] 32˚C
   b] 35˚C
   c] 37˚C
   d] 40˚C

3. Rahul wants to test whether a white object or a black object would heat up faster in the Sun. The given picture shows you his experiment. These thermometers were left out in the Sun for 30 minutes.



   a] Thermometer 1 reads the same as thermometer 2.
   b] Thermometer 1 reads the same as thermometer 3.
   c] Thermometer 3 shows a higher temperature than thermometer 1.
   d] Thermometer 2 shows a higher temperature than thermometer 3.

4. The transfer of heat by convection can take place in –

   a] Solids and liquids
   b] Solids and vacuum
   c] Gases and liquids
   d] Vacuum and gases

5. A copper ball at 55˚C is dropped in a mug containing water at 55˚C. The heat will **–**

a] Flow from iron ball to water

b] Not flow from iron ball to water or from water to iron ball

c] Flow from water to iron ball

d] Increase the temperature of both

6. The liquid metal used in a thermometer is-

a] Copper b] Platinum

c] Gold d] Mercury

7. The heat from the sun reaches us on the earth by the process of –

a] Conduction b] Convection

c] Radiation d] None of these

8. For question numbers 8 to 10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R).

Select the correct answer to the following questions from the codes (i), (ii), (iii) and (iv) as given below-

i) Both A and R are true and R is correct explanation of the assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true

9. **Assertion (A):** Woollen clothes keep the body warm in winter.

Reason (R): There is air trapped in between woollen fibres and air is bad conductor of heat.

[i] Both A and R are true and R is correct explanation of the assertion.

10. **Assertion (A):** Digital thermometer does not use mercury.

Reason (R): Mercury is the only metal found in the liquid state at room temperature.

[ii] Both A and R are true but R is not the correct explanation of the assertion.

11. **Assertion (A):** Temperature of boiling water can be measured by a clinical thermometer.

Reason (R): The range of a clinical thermometer is from 35˚C to 42˚C.

[iv] A is false but R is true.

II. BASIC CONCEPTS LEVEL:

1. What is temperature?

   [A reliable measure of the hotness of an object is its temperature.]

2. Why do we wear light coloured cotton clothes in summer?

   [Light coloured cotton clothes give us a feeling of coolness by reflecting heat.]

3. What is thermometer?

   [A device used for measuring temperatures is called thermometer.]

4. Write the difference between conductors and insulators of heat. Give suitable examples.

   [Conductors – The materials which allow heat to pass through them easily. Eg. Iron, copper etc. Insulators – The materials which do not allow heat to pass through them easily. Eg. Wood, plastic etc.]

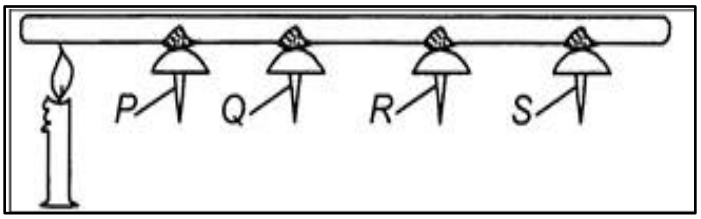
5. State the method by which heat is transferred in the following situations–

   a] from a hot iron vessel to a man's hand when placed on it. [Conduction]

   b] from the bottom of a hot water to its upper cooler parts. [Convection]

   c] from room heater to a person sitting in front of it- [Radiation]

6. 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 reason.

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

7. What are the conditions necessary for heat to be conducted?

   [Two bodies should be in solid state, they should be in direct contact with each other, their temperatures should be different.]

8. How do woollen clothes keep us warm in the winter?

   [Wool is poor conductor of heat. The woollen fibres trap air in between them. This air prevents the flow of heat from our body to the colder surroundings. So, we feel warm.]

III. INTERMEDIATE LEVEL:

1. Explain the use of a kink in a clinical thermometer.

   [Kink prevents immediate backflow of the mercury from the tube to the bulb, thus it allows us to read the temperature conveniently.]

2. Why is it advised not to hold the thermometer by its bulb while reading it?

   [If we hold a thermometer by its bulb, the mercury in the bulb will expand or contract due to our body temperature Hence we will not obtain correct reading of temperature.]

3. A clinical thermometer has the range between 35^0C to 42^0C. Give reason.

   [Because the temperature of human body does not go below 35^0C or above 42^0C.]

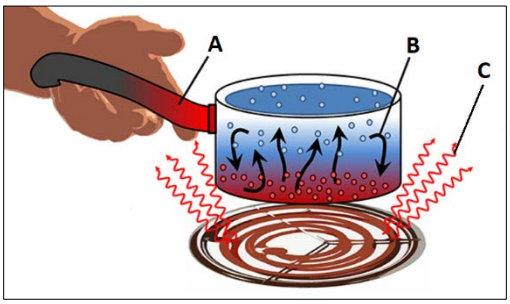
4. Differentiate between the clinical thermometer and the laboratory thermometer.

Clinical thermometer	Laboratory thermometer
1] The range of a clinical thermometer is from 35˚C to 42˚C	1] The range of a laboratory thermometer is generally from -10˚C to 110˚C
2] Kink is present	2] Kink is absent
3] It is used only for measuring human body temperature	3] It is used for measuring the temperature of other objects

5. Why we give a jerk to the clinical thermometer before taking a new reading?

   [To bring the level of mercury below 35^0c.]

6. Observe the figure given below, identify a,b and c and explain each of them.



[A – CONDUCTION – The process by which heat is transferred from the hotter end to the colder end of an object without actual movement of particles. B – CONVECTION – The method in which heat is transferred by actual movement of the particles of a substance. C – RADIATION – It is a process of heat transfer which does not require any material medium.]

7. Write any two applications of convection and radiation in daily life.

   [Convection – i] Room heater warms the air near the floor. When the warm air rises upwards, 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.

   Radiation – i] In cold and hilly areas, the outer walls and roofs are usually painted dark to keep the houses warm, ii] In factories, the roofs are painted shiny silver to reduce the loss of heat in winters and increase the radiation of heat in summers.]

8. What are the precautions to be taken while using a laboratory thermometer and clinical thermometer?

   [Clinical thermometer –

   i] Thermometer should be washed before and after use, preferably with an antiseptic solution.

   ii] Ensure that the mercury level is below 35˚C.

   iii] Our eyes should be at the level of the mercury while reading the temperature.

   iv] Handle the thermometer with care. If it hits against some hard object, it can break.

   v] Do not hold the thermometer by the bulb while reading it.

   Laboratory thermometer –

   i] Thermometer should be washed before and after use, preferably with an antiseptic solution.

   ii] It should be kept upright not tilted.

   iii] Bulb should be dipped in the substance in the vessel.

   iv] The bulb should not touch the sides or base of the container.]

IV. ADVANCED LEVEL:

1. State the reasons why mercury is very commonly used in thermometers?

   [Because it is the only metal which is found in liquid state, it does not stick to the walls of the glass, it's boiling point is very high and has low freezing point, it is shiny which makes it easily visible through the glass, it expands equally for every degree of rise in temperature.]

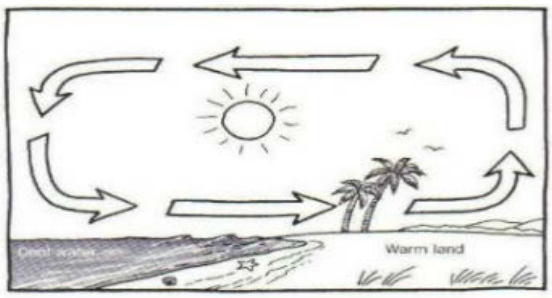
2. Why are air conditioners fitted at higher level in the rooms?

   [In order to produce quick cooling in the room. This is because cool air from the air conditioner comes down and the warm air from below rises up.]

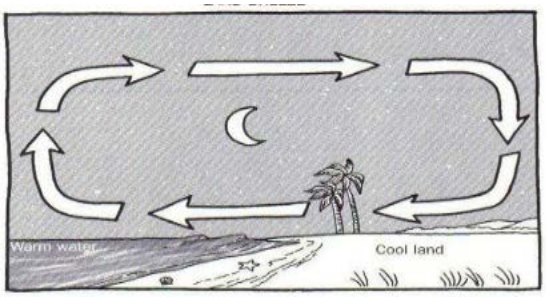
3. The houses in Oman are painted with light colours. Why?

   [Because white colour reflects most of the sun's heat rays. This keeps the house cool.]

4. It is preferred to use two thin blankets rather than one thick blanket. Explain.
   [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 surrounding and hence keep us warm.]
5. Explain the difference between sea-breeze and land -breeze with the help of labelled diagrams.



SEA BREEZE



LAND BREEZE

[**SEA BREEZE** - During the day, the land heats up much faster than sea water. So, air above the land becomes hotter and rises up. The cool air above the sea surface moves towards land to fill the space. This flow of air from sea towards the land is called **sea breeze**.
LAND BREEZE – At night, the land cools much faster than the sea water. So, the air above the land surface is cooler than the air over the sea. The warm air above the sea surface rises up. The cool air from the land moves towards the sea. This flow of air from land towards the sea is called **land breeze.**]

IV. EXEMPLAR QUESTIONS:

1. While constructing a house in a coastal area, in which direction should the windows preferably face and why?
   [Windows should face towards the sea because sea breeze coming from the sea keeps the house cool during day time.]
2. A person has a white shirt and a black shirt. Which shirt will make him more comfortable in - a) winters b) summers? Give reasons for your answers.
   [a) Black fabric in winters, because dark surfaces absorb more heat.
   b) White fabric in summers, because white colour reflects most of the heat.]