

Grade VII
Chapter 4 – Heat and its effects
Question Bank

I. VERY SHORT ANSWER TYPE QUESTIONS (1M):

1. Define temperature.
[Hint: A reliable measure of the hotness of an object is its temperature.]
2. Name the device used to measure temperature. [Hint: Thermometer]
3. What is the use of kink in a clinical thermometer?
[Hint: Kink prevents immediate backflow of mercury from the tube to the bulb, thus it allows us to read the temperature conveniently.]
4. What is the direction of flow of heat when you touch a cold object?
[Hint: When we touch a cold object, heat flows from our body to the cold object].
5. What are the scales commonly used to measure temperature?
[Hint: Celsius and Fahrenheit are the two scales commonly used to measure temperature.]
6. What is the normal temperature of the human body?
[Hint: The normal temperature of the human body is 37°C .]
7. A clinical thermometer has the range between 35°C to 42°C . Give reason. [Hint: The temperature of human body does not go below 35°C or above 42°C .]
8. How is heat transferred in liquids and gases?
[Hint: In liquids and gases the heat is transferred by convection.]
9. Why do we wear light coloured cotton clothes in summer?
[Hint: Light coloured cotton clothes give us a feeling of coolness by reflecting heat.]
10. Mention the range of laboratory thermometers.
[Hint: The range of laboratory thermometers is from -10°C to 110°C .]

For question numbers 11 to 13, two statements are given- one labelled Assertion (A) and the other labelled Reason (R).

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

- (i) Both A and R are true and R is the 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.
11. Assertion (A): Woollen clothes keep the body warm in winter.
Reason (R): There is air trapped in between woollen fibres and air is a bad

conductor of heat.

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

12. 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.

13. Assertion (A): All hot bodies radiate heat.

Reason (R): When heat falls on an object, a part of it is reflected, a part is absorbed and a part may be transmitted.

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

II. PASSAGE BASED QUESTIONS:

Read the passage and answer the questions that follows:

In solids, generally, the heat is transferred by conduction. In liquids and gases, the heat is transferred by convection. When we come out in the sun, we feel warm. How does the heat from the sun reach us? It cannot reach us by conduction or convection as there is no medium such as air in most part of the space between the earth and the sun. From the sun, the heat comes to us by another process known as radiation. The transfer of heat by radiation does not require any medium. It can take place whether a medium is present or not. When we sit in front of a room heater, we get heat by this process. Our body too, gives heat to the surroundings and receives heat from it by radiation.

i) When a pan is removed from the fire:

a) heat is transferred to the surroundings

b) the pan cools down.

c) Heat transfer occurs by radiation.

d) All of these.

ii) Handles of cooking utensils should be made of a material that:

a) conducts heat well.

b) does not conduct heat well.

c) radiates heat well.

d) absorbs heat well.

iii) Heat from the sun reaches to us by :

a) radiation

b) conduction

c) convection

d) all of these

iv) Identify the correct statement

a) All hot bodies radiate heat.

b) The temperature of the object decreases due to the absorbed part of the heat.

c) The transfer of heat by radiation requires a medium.

d) Our body cannot receive heat by radiation

v) The given figure demonstrates



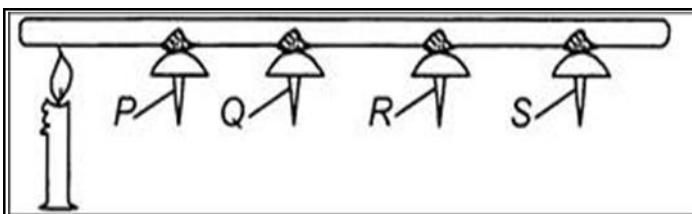
- a) Conduction of heat
- b) Convection of heat by water
- c) Convection in air
- d) Radiation of heat

III. CASE STUDY BASED QUESTIONS

1. Paheli and Boojho measured their body temperature. They try to find the body temperature by using different scales. Paheli found her temperature to be 98.6°F and Boojho recorded 37°C . Which among the following statements is true?
 - a) Paheli has a higher body temperature than Boojho.
 - b) Paheli has a lower body temperature than Boojho.
 - c) Both have normal body temperature.
 - d) Both are suffering from fever.
2. In a construction site, the builders made plans to construct buildings that are comfortable to live both in summers and winters. It is made possible by :
 - a) Constructing ventilators.
 - b) Using hollow bricks.
 - c) Painting light colour on outer walls in summer.
 - d) All of these.
3. Two containers, A and B are having water at 100°C . Container B is covered with a woollen cloth. The water in container:
 - a) B cools faster than that of A.
 - b) A cools faster than that of B.
 - c) A cools at the same rate as that of B.
 - d) Both A and B remain hot.

IV. SHORT ANSWER TYPE QUESTIONS (2 M):

1. 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:



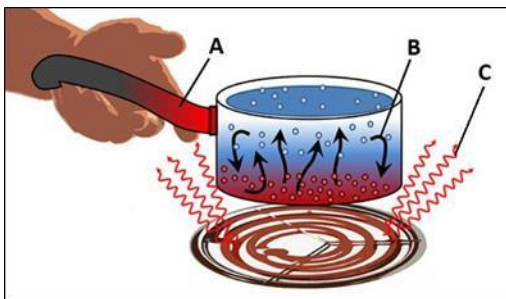
Which one of the pins will fall off the metal rod first? Give reason.

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

2. The houses in Oman are painted with light colours. Why?
[Hint: White colour reflects most of the sun's heat rays and keeps the house cool.]
3. It is preferred to use two thin blankets rather than one thick blanket. 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 keep us warm.]
4. A few sharp jerks are given to a clinical thermometer before using it. Why is it done so?
[Hint: Jerks are given to a clinical thermometer before using it to settle down the mercury level below normal temperature so that the measurement taken be accurate.]
5. The handle of a pressure cooker is covered with the thick plastic. Explain why. [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].
6. What are the conditions necessary for heat to be conducted?
[Hint: Two bodies should be in solid state, they should be in direct contact with each other and their temperatures should be different.]
7. How does the heat travel in air?
[Hint: The air near the heat source gets hot and rises. The air from the sides comes in to take its place. In this way the air gets heated.]
8. In a mercury thermometer, the level of mercury rises when its bulb comes in contact with a hot object. Give reason.
[Hint: As the temperature increases, expansion in mercury takes place which leads to a rise in the level of mercury in the thermometer.]
9. Mention any two examples each of insulators as well as of conductors.
[Hint: Copper and Aluminium are examples of conductors which allow the heat to pass through them. While wood and plastic are examples of insulators which do not allow heat to pass through them.]

IV. SHORT ANSWER TYPE QUESTIONS (3 M)

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



[Hint: 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.]

2. State the reasons why mercury is very commonly used in thermometers? [Hint: i) It is the only metal which is found in liquid state.
- ii) It does not stick to the walls of the glass.
 - iii) It's boiling point is very high and has low freezing point.
 - iv) It is shiny which makes it easily visible through the glass.
 - v) It expands equally for every degree of rise in temperature.]
3. Write any two applications of convection and radiation in daily life.
- [Hint: Convection – i) Room heaters are placed at a lower level -The 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.
- 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.]
4. Write the difference between conductors and insulators of heat. Give suitable examples.
- [Hint: Conductors – The materials which allow heat to pass through them easily. eg. Iron and Copper
- Insulators – The materials which do not allow heat to pass through them easily. eg. Wood and plastic.]
5. What is meant by heat transfer? Explain.
- [Hint: Flow of heat from one object to another with or without a medium is called transfer of heat. Heat always flows from a body at higher temperature

to another body at lower temperature. The flow of heat stops when temperature of both the bodies becomes equal. Transfer of heat take place through the methods of conduction, convection and radiation.]

6. Explain how the temperature of water can be measured by using a laboratory thermometer.

[Hint : To measure the temperature of water by using a laboratory thermometer, we should follow the following steps:

- i) Take water in a beaker.
- ii) Dip the laboratory thermometer in the water so that its bulb gets completely immersed in it, but make sure the bulb doesn't touch the bottom of the beaker.
- iv) Hold the thermometer vertically.
- v) Observe the movement of the thread of mercury.
- vi) Note the reading when mercury thread becomes steady.]

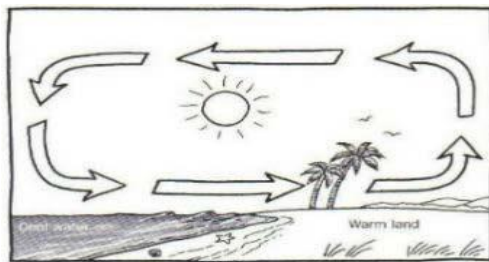
V. LONG ANSWER TYPE QUESTIONS (5 M):

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

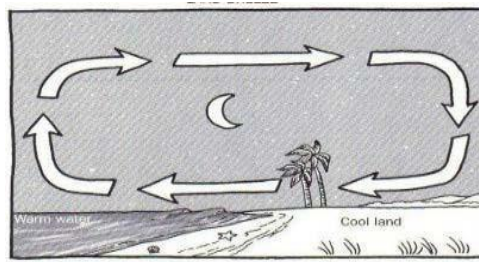
[Hint: Clinical thermometer -

- 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.]

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



SEA BREEZE



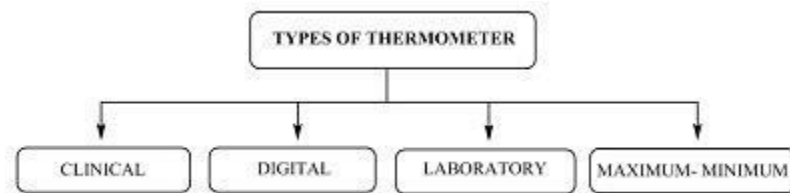
LAND BREEZE

[Hint: **SEA BREEZE** - During the day, the land heats up much faster

than seawater. So, 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**.]

3. Describe different types of thermometers.



[Hint: i) Clinical thermometer

The thermometer that measures our body temperature is called a clinical thermometer. It consists of a long, narrow, uniform glass tube. It has a bulb at one end which contains mercury. A clinical thermometer reads temperature from 35°C to 42°C.

ii) Digital thermometer

Digital thermometers are an advance to the existing clinical thermometers. Due to high toxicity of the Mercury present in clinical thermometers and difficulty in its disposal in cases when the thermometer breaks, digital thermometers are manufactured that can measure the accurate temperature without the use of mercury.

iii) Laboratory thermometer

Laboratory thermometer is used to measure the temperature of things other than human body. The range of a laboratory thermometer is generally from -10°C to 110°C.

iv) Maximum- minimum thermometer _

The daily maximum and minimum temperatures reported in weather reports, are all measured by a thermometer known as the Maximum minimum thermometer.]