

**Class: VII**  
**Subject: Physics**  
**Topic: Heat**  
**No. of Qs: 20**

Q 1. What is the common unit of measurement of temperature?

Sol: The common unit of measurement of temperature is degree Celsius.

Q 2. Often before sunrise on a clear, calm, cold morning, ice (frost) can be seen on the top of parked cars, even when the air temperature is above freezing. Why does this happen?

Sol: Often before sunrise on a clear, calm, cold morning, ice (frost) can be seen on the top of parked cars, even when the air temperature is above freezing. This happens because the tops of the cars are cooled by radiation.

Q 3. In what ways the heat can be transferred from one place to another?

Sol: Heat can be transferred by means of

- (a) conduction
- (b) convection
- (c) radiation

Q 4. Write three precautions in using a laboratory thermometer.

Sol: The precautions needed while reading a laboratory thermometer are:

1. It should be kept upright not tilted.
2. Bulb should be surrounded from all sides by the substance of which the temperature is to be measured.
3. The bulb should not touch the surface of the container.

Q 5. An iron ball at  $40^{\circ}\text{C}$  is transferred to a mug containing water at a temperature of  $40^{\circ}\text{C}$ . In which direction will the heat flow?

Sol: Heat will not flow because both, the iron ball and the water, are at the same temperature. (Generally heat flows from the hot object to the cold one).

Q 6. Why should the room heaters be placed at the floor of the room?

Sol: Room heaters should be placed at the floor of the room so that the air heated by it rises up and sets up the convection current in the room quickly and uniformly.

Q 7. A hot utensil kept away from the flame cools down. How?

Sol: A hot utensil kept away from the flame cools down as it transfers heat to the surroundings by radiation.

Q 8. If air is a bad conductor of heat, why do we not feel warm without clothes?

Sol: This is because when we are without clothes, air carries away heat from our body due to convection and hence we feel cold.

Q 9. What is the other name of poor conductors of heat?

Sol: Poor conductors of heat are also called insulators.

Q 10. Which of the following properties is not a characteristic of mercury?

Sol: A. It sticks to the sides of a glass tube.

B. Its freezing point is about  $39^{\circ}\text{C}$ .

C. Its boiling point is about  $357^{\circ}\text{C}$ .

D. It is a good conductor of heat.

Q 11. How are ocean currents formed?

Sol: Ocean currents are caused due to the movement of ocean water, resulting from the temperature difference between ocean water at equatorial and polar regions.

Q 12. How does a mud house remain cool in summers and warm in winters?

Sol: Mud is a bad conductor of heat. It does not allow heat to go out of the house in winters or enter the house in summers. Therefore, mud houses remain warm in winters and cool in summers.

Q 13. One litre of water at 30°C is mixed with water at 50°C, then the mixture will have temperature

- A. 80°C
- B. 20°C
- C. More than 80°C
- D. In between 30°C and 50°C

Sol: The mixture will have temperature in between 30°C and 50°C since the hot water (at 50°C) will try to lose its heat to the cold water (at 30°C) and therefore, the hot water cools down and the cold water heats up to an equilibrium temperature.

Q 14. Stainless steel pans are usually provided with copper bottoms. Why?

Sol: Stainless steel pans are usually provided with copper bottoms because copper is a better conductor of heat than stainless steel hence cooking of food becomes faster.

Q 15. A child has a viral infection and his body temperature is 101.5° F. Find the corresponding temperature in °C?

Sol:  $(^{\circ}\text{F} - 32) \times \frac{5}{9} = ^{\circ}\text{C}$

$$(101.5^{\circ}\text{F} - 32) \times \frac{5}{9} = 38.61^{\circ}\text{C}$$

Q 16. (a) What is a laboratory thermometer.

(b) Which thermometer is used to measure very high temperatures?

Sol: (a) A laboratory thermometer is a thermometer used to measure temperatures in range - 10 °C to 110 °C.

(b) Pyrometer is used to measure very high temperatures.

Q 17. In boiling of water in a steel utensil by using a stove, describe the process of heat transfer.

Sol. At first, heat is transferred from the stove to utensil by conduction. Then heat is given to water by conduction through utensil and then in water, heat flows by convection.

Q 18. (i) How does the convection current form?

(ii) A hot utensil kept away from the flame cools down. How?

Sol: (i) When hot particles in a medium rise up and cold particles move down to take their place, convection currents are formed.

(ii) A hot utensil kept away from the flame cools down as it transfers heat to the surroundings by radiation.

Q 19. For an astronaut working outside a spaceship, the greatest loss of heat would occur by means of which mode of heat transfer?

Sol: For an astronaut working outside a spaceship, the greatest loss of heat would occur by radiation since there is no medium present in the space for conduction or convection to occur.

Q 20. Why should air coolers be kept higher up in the room, and not down like the heaters?

Sol: Cool air is denser so it moves down whereas warm air is lighter so rises up hence convection currents are formed that helps in circulating the cold air and keeps the room cool.

If the air cooler is not kept higher up, then the cool air will remain at the surface layer and warm air will remain at the top, hence no circulation of air will take place and room will remain warm.