

CLASS: VII

SUBJECT: SCIENCE

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CH-3

HEATI SHORT ANSWER TYPE QUESTIONS:

1. Why is heat transfer by convection possible only in liquids and gases? (TB Q3)

Ans. Convection is the process of heat transfer in which heat is transferred from one place to the other [from hotter part to the colder one] by the actual movement of the particles of the medium.

In liquids and gases, the molecules are not firmly bound together and can move freely. Hence, heat transfer by convection is possible in liquids and gases.

In solid, the molecules are firmly bound together and cannot move freely. Hence convection is not possible in solids.

2. In places of hot climate, it is advised that the outer walls of houses be painted white. Why?

Ans. In places of hot climate, it is advised that outer wall of houses be painted white because white colour reflects heat and the houses do not heat up too much.

3. Convert :

a) 20°C to $^{\circ}\text{F}$

b) 212°F to $^{\circ}\text{C}$

Ans a) Given 20°C

$$\frac{C}{100} = \frac{F-32}{180}$$

$$\frac{20}{100} = \frac{F-32}{180}$$

$$\frac{36}{180} = \frac{F-32}{180}$$

$$36 = F-32$$

$$F = 36+32$$

$$F = 68^{\circ}$$

$$\boxed{20^{\circ}\text{C} = 68^{\circ}\text{F}}$$

b) Given 212°F

$$\frac{C}{100} = \frac{F-32}{180}$$

$$\frac{C}{100} = \frac{212-32}{180}$$

$$\frac{C}{100} = \frac{180}{180}$$

$$C = 1 \times 100$$

$$C = 100^{\circ}$$

$$\boxed{212^{\circ}\text{F} = 100^{\circ}\text{C}}$$

4. Pieces of copper and glass are heated to the same temperature. Why does the piece of copper feel hotter on touching?

Ans. We know that copper is a far better conductor of heat than glass. When we touch the hot copper piece, it transmits heat readily to the hand. But this is not in the case when the hot glass piece is touched.

II LONG ANSWER TYPE QUESTIONS:

1. What is meant by a temperature scale? Describe celsius scale. (TB Q1)

Ans. Temperature scale:

The scale on which temperature is measured is called temperature scale. There are three temperature scales. They are,

- i) Celsius scale
- ii) Fahrenheit scale
- iii) Kelvin scale

Celsius scale:

* On this scale, temperature is described in degree celsius ($^{\circ}\text{C}$).

* The lower fixed point of the celsius scale is 0°C

* The upper fixed point of the celsius scale is 100°C

* The interval between these two points is divided into 100 ($=100-0$) equal divisions.

* Thus, the unit division on this scale corresponds to a temperature equal to 1°C .

2. Describe a clinical thermometer. Why doesn't a clinical thermometer has markings above 42°C ?
(TB Q2)

Ans. * A clinical thermometer [or Doctor's thermometer] is used for measuring the body temperature of humans and animals.

* It has a narrow kink (or constriction) in the capillary tube just above the bulb.

* When the mercury expands, it pushes through the kink, but when it is taken out of the patient's mouth, mercury does not go back to the bulb.

* So the doctor can read the patient's temperature easily.

* The mercury can be brought back into the bulb by just giving it a jerk after the thermometer has been read.

The temperature of human body does not rise above 42°C , that is why the clinical thermometer does not contain markings above 42°C .

3. Compare conduction, convection and radiation.
(TB Q5)

Ans. Conduction:

The process in which heat is transferred from one particle to another in the direction of lower temperature without the actual movement of the particles of the medium is called conduction of heat.

Convection :

When water is heated in a round bottom flask, water near the bottom of the flask gets heated first. Warm water is lighter than the surrounding cold water. So, it rises up. The colder water from the surroundings moves down, gets heated and rises up. This process continues until the entire water attains a uniform temperature.

This cyclic movement of water during heating is called convection current.

Radiation :

The process of transmission of heat in which heat energy travels in straight lines from the hotter body to the colder one without any material medium, is called radiation. The transfer of heat energy of the sun to the earth is the best example of radiation.

II HIGHER ORDER THINKING SKILLS:

1. Why are the pipes of solar heater and the containers of solar cooker painted black?

Ans. The pipes of solar heaters and the containers of solar cooker are painted black because black colour absorbs heat more than any other colour and this will help to keep the pipes and containers warmer.

2. Two objects at the same temperature one smaller than the other, are placed together. In which direction will the heat be transferred? Give reason.

Ans. The direction of heat transfer would be from larger to smaller object because larger object has more surface area due to which it loses its heat much faster.

3. Why is a room heater placed near the floor and an air-conditioner near the ceiling?

Ans. A room heater is placed near the floor because hot air is light. It will move up from the floor to the roof and this will make the room heated properly. An air conditioner is placed near the ceiling because cool air being heavy will move down and make the room cooler.

I. SHORT ANSWER QUESTIONS:

Q1 : Pg. no. 48

Q2 : Pg. no. 59

Q4 : Pg. no. 51

Q5 : Pg. no. 55

II. LONG ANSWER TYPE QUESTIONS:

Q3 : Pg. no. 51

Q4 : Pg. no. 53