

TEMPERATURE AND ITS MEASUREMENT

1. Short and long Answer: (Refer Questions in book back)
1. At what temperature is the value on the celsius scale equal to that on Fahrenheit scale?

Ans: Taking $F = C$ in the below formula,

$$\frac{C}{5} = \frac{F - 32}{9}$$

$$F = \left(C \times \frac{9}{5}\right) + 32$$

$$C = \frac{9C}{5} + 32$$

$$C - \frac{9C}{5} = 32$$

$$\frac{5C - 9C}{5} = 32$$

$$-4C = 32 \times 5$$

$$C = \frac{-32 \times 5}{4} = -40$$

Thus, at -40°F temperature is equal to -40°C .

5. A few sharp jerks are given to a laboratory thermometer before using it. why is it done so?

Ans: This is done to ensure that the mercury thread is reset to the lower end of the thermometer's scale.

6. Temperature of two bodies differ by 1°C .
By how much do they differ on the Fahrenheit scale?

Ans: The equation to convert $^{\circ}\text{C}$ to $^{\circ}\text{F}$ is

$$F = \left(C \times \frac{9}{5}\right) + 32$$

The +32 is to account for the fact that 0°C is equivalent to 32°F , using this equation after removing +32. we can see that $1^{\circ}\text{C} = 1.8^{\circ}\text{F}$. So the temperature of second system is 1.8°F .

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

Ans: The bulb of the thermometer contains a temperature-sensitive liquid (mercury). If one holds the bulb, heat from his/her hand can transfer to the liquid, causing it to expand and gives a false reading.

10. Why doesn't a clinical thermometer has markings above 42°C ?

Ans: A clinical thermometer does not have markings above 42°C because the normal human body temperature does not exceed 42°C .

ii. Higher order thinking skills:

1. What will happen if coloured water is used instead of mercury in a thermometer?

Ans: Using coloured water instead of mercury in a thermometer would impact its accuracy and sensitivity. Water expands and contracts more significantly with temperature change compared to mercury, leading to less precise measurements.

2. What is the value of absolute zero on the Fahrenheit scale.

Ans: Absolute zero is the least possible temperature of an object.

The absolute zero of Fahrenheit scale is -460°F .

3. Which represents the greater temperature rise, 10°C or 10°F .

Ans: $\frac{C}{100} = \frac{F}{180}$

$$F = \frac{10}{100} \times 180 = 18^{\circ}$$

10°C rise is equivalent to 18°F

Similarly, 10°F rise is equivalent to 5.55°C

\therefore The greater temperature rise is 10°C .