

Q10. A solution is to be kept between 40°C and 45°C . What is the range of temperature in degree Fahrenheit, if the conversion formula is $F = \frac{9}{5} C + 32$?

Sol. Let the required temperature be $x^{\circ}\text{F}$

Also given that, $F = \frac{9}{5} C + 32$

$$\Rightarrow 5F = 9C + 32 \times 5 \Rightarrow 9C = 5F - 160$$

$$\therefore C = \frac{5F - 160}{9}$$

Since temperature in degree Celsius lies between 40°C to 45°C , we get

$$40 < \frac{5F - 160}{9} < 45$$

$$\Rightarrow 40 \times 9 < 5x - 160 < 45 \times 9$$

$$\Rightarrow 360 < 5x - 160 < 405 \Rightarrow 520 < 5x < 565$$

$$\Rightarrow \frac{520}{5} < x < \frac{565}{5} \Rightarrow 104 < x < 113$$

Hence, the range of temperature in degree Fahrenheit is 104°F to 113°F .