

Assignment 3-Heat

Home Classwork

Numerical Problems

a) Convert 100°C and $^{\circ}\text{F}$ and K .

→ Solⁿ

Here,

$$\text{Formula} = \left(\frac{C - 100}{100} = \frac{F - 32}{180} = \frac{K - 273}{100} \right)$$

Now,

① Converting $^{\circ}\text{C}$ to $^{\circ}\text{F}$,

$$100^{\circ}\text{C} = \left(\frac{C - 100}{100} = \frac{F - 32}{180} \right)$$

$$= \left(\frac{100 - 0}{100} = \frac{F - 32}{180} \right)$$

$$= \left(\frac{100}{100} = \frac{F - 32}{180} \right)$$

$$= \left(F - 32 = \frac{100 \times 180}{100} \right)$$

$$= \left(F = 180 + 32 \right)$$

$$\therefore F = 212$$

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

$$\begin{array}{r} 180 \\ + 32 \\ \hline 212 \end{array}$$

② Converting $^{\circ}\text{C}$ to K.

→

$$100^{\circ}\text{C} = \left(\frac{\text{C} - 0}{100} = \frac{\text{K} - 273}{100} \right)$$

$$= \left(\frac{100 - 0}{100} = \frac{\text{K} - 273}{100} \right)$$

$$= \left(\frac{100}{100} = \frac{\text{K} - 273}{100} \right)$$

$$= (\text{K} - 273 = \frac{100 \times 100}{100})$$

$$= (\text{K} - 273 = 100)$$

$$= (\text{K} = 100 + 273)$$

$$= (\text{K} = 373)$$

$$\therefore 100^{\circ}\text{C} = 373 \text{ K}$$

b) Convert 200°C into $^{\circ}\text{F}$.

→ Soln,

Here,

$$^{\circ}\text{C} = 200$$

$$^{\circ}\text{F} = ?$$

Now,

$$\frac{C-0}{100} = \frac{F-32}{180}$$

$$\text{or, } \frac{200-0}{100} = \frac{F-32}{180}$$

$$\text{or, } \frac{200 \times 180}{100} = F-32$$

$$\text{or, } F = \frac{200 \times 180}{100} + 32$$

$$\text{or, } F = 20 \times 18 + 32$$

$$\therefore F = 392$$

So,

$$\underline{200^{\circ}\text{C} = 392^{\circ}\text{F}}$$

c) Convert 90°F & $^{\circ}\text{C}$.

→ Soln,

Here,

$$^{\circ}\text{F} = 90$$

$$^{\circ}\text{C} = ?$$

We have,

$$\frac{F-32}{180} = \frac{C-0}{100}$$

$$\text{or, } \frac{90-32}{180} = \frac{C}{100}$$

$$\text{or, } \frac{58 \times 100}{180} = C$$

$$\text{or, } 32.22 = ^\circ\text{C}$$

$$^\circ\text{C} = 32.22$$

So,

$$\underline{90^\circ\text{F} = 32.22^\circ\text{C}}$$

d) Convert 273K into $^\circ\text{C}$.

→ Solⁿ

Here,

$$K = 273$$

$$^\circ\text{C} = ?$$

We have,

$$\frac{C - 0}{100} = \frac{K - 273}{100}$$

$$\text{or, } \frac{K - 273}{100} = \frac{C}{100}$$

$$\text{or, } 273 - 273 = C$$

$$\therefore C = 0$$

So,

$$\therefore 273\text{K} = 0^\circ\text{C}$$

e) Convert 373K into $^\circ\text{F}$.

→ Soln,

Here,

$$K = 373$$

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

We have,

$$\frac{F-32}{180} = \frac{K-\cancel{273}273}{100}$$

$$\text{or, } \frac{F-32}{180} = \frac{373-\cancel{100}373-273}{100}$$

$$\text{or, } \frac{F-32}{180} = \frac{100}{100}$$

$$\text{or, } F-32 = \frac{\cancel{100} \times 180}{\cancel{100}}$$

$$\text{or, } F = 180 + 32$$

$$\therefore F = 212$$

So,

$$\therefore 373K = 212^{\circ}F$$