7th foundation

ws-12 Heat

Thank

(1)

Freezing point = melting point of ice = 0°C → B

(2)

water boils at 100°C.

∴ Temperature on kelvin scale = 273.15+C

= 273.15+100

= 373.15 K

(3)

The temperature scale used in everyday life is celsius scale

(4)

Boiling point of water = 100°C in celsius scale on Fahrenheit scale it is 212°F

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

$\Rightarrow \frac{20}{100} = \frac{5}{9}(F-32)$

$\Rightarrow 20 = \frac{1}{9}(F-32) \Rightarrow 9\times 20 = F-32$

$\Rightarrow 180 = F-32$

$\Rightarrow F = 180+32 = 212°F$

(5)

Absolute zero on kelvin scale = -273.15 k.

(6)

Given $C = F$

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

$\Rightarrow C = \frac{5}{9}(C-32)$

$\Rightarrow 9C = 5C - 160$

$\Rightarrow 4C = -160 \Rightarrow C = -40^\circ$

(7)

Temperature in centigrade scale equal to 68°F is

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

$= \frac{5}{9}(68-32) = \frac{5}{9} \times 36^4 = 5 \times 4 = 20^\circ C$

Temp difference between 20°c and 68°c is 48°c

(9) (10)

Relation between celsius and fahrenheit

$\Rightarrow \frac{C-L.F.P_1}{U.F.P_1 - L.F.P_1} = \frac{F-L.F.P_2}{U.F.P_2 - L.F.P_2}$

$\Rightarrow \frac{C-0}{100-0} = \frac{F-32}{212-32}$

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

$\Rightarrow C = (F-32) \times \frac{100}{180}$

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

(2)

$C = 50^\circ C$

$K = 273 + C = 273 + 50 = 323\,K.$

We know $\frac{C}{100} = \frac{R}{80} \Rightarrow \frac{50}{100_2} = \frac{R}{80_{40}}$

$\Rightarrow R = 40^\circ R$

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

$\Rightarrow \frac{10}{50} = \frac{5}{9}(F-32)$

$\Rightarrow 10 = \frac{1}{9}(F-32) \Rightarrow F-32 = 90$

$\Rightarrow F = 90+32 = 122^\circ F$

(4)

There are 100 divisions between ice point (273k) and steam point (373k).

Each part value $= \frac{1}{100}$ of difference.

In Reaumur scale = 80 division are there between ice point ($0^\circ R$) and steam point ($80^\circ R$).

Each division $= \frac{1}{80}$ of difference.

(7)

Given $k = 200\,k$

We know that $k = 273 + C$

$\Rightarrow 200 = 273 + C$

$\Rightarrow C = 200 - 273 = -73^\circ C.$

(8)

Given $C = 37^\circ C$

$K = 273 + C$

$= 273 + 37 = 310\ K.$

(9)

Given $F = 100^\circ F$

From $\frac{R}{80} = \frac{(F-32)}{180}$

$\Rightarrow \frac{R}{4} = \frac{(100-32)}{9} = \frac{68}{9}$

$\Rightarrow R = 4 \times \frac{68}{9} = 30.2\ R.$

(10)

$100^\circ C$ equal to

$K = 273 + C = 273 + 100 = 373\ K$

From $\frac{C}{100} = \frac{R}{80} \Rightarrow \frac{100}{100} = \frac{R}{80} \Rightarrow R = 80^\circ R$

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

$\Rightarrow 20 = \frac{5}{9}(F-32)$

$\Rightarrow 20 = \frac{1}{9}(F-32)$

$\Rightarrow 20 \times 9 = F - 32$

$F = 180 + 32 = 212^\circ F$

2 Tank

Advanced

(3)

Mercury is a good conductor of liquids.
It can easily obtained in pure state.
It does not stick to glass tube thermometer.
It has very high density. It has low freezing point and a very high boiling point

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(9)

As altitude increases, the amount of air over a unit area decreases. Therfore, the atmospheric pressure will reduce due to lower air molecules.

(10)

The pressure exerted by a liquid increases with depth. This is due to an increase in hydrostatic pressure, the force per unit area exerted by a liquid on an object. As you go deeper, the area of liquid exerting pressure increases, thus it also increases the pressure.