by eq (2) & (3)

$$K_2 \frac{A(T_1-T_2)}{l} = K_3 \frac{A(T_2-18)}{l}$$

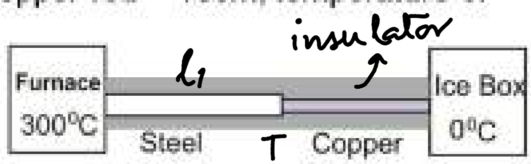
$$4k(T_1-T_2) = 3k(T_2-18)$$

$$4T_1 - 4T_2 = 3T_2 - 54$$

$$4T_1 - 7T_2 = -54 \quad \text{—(5)}$$

by solving eq (4) and (5) we get the values of T_1 and T_2.

EXAMPLE: What is the temperature of the steel-copper junction in the steady state of the system shown in fig. length of the steel rod = 15cm, length of the copper rod = 10cm, temperature of furnace = 300°C, temperature of the other end = 0°C. The area of cross-section of the steel rod is twice that of the copper rod. Thermal conductivity of steel = 50.2 $Js^{-1}m^{-1}\,{}^{0}C^{-1}$ and that of copper = 385 $Js^{-1}m^{-1}\,{}^{0}C^{-1}$



$l_1 = 15cm$

$l_2 = 10cm$

$A_1 = 2A_2$

$K_1 = 50.2\ Js^{-1}m^{-1}C^{-1}$

$K_2 = 385\ Js^{-1}m^{-1}C^{-1}$