For steel rod $\frac{\Delta Q}{\Delta t} = K_1 \frac{A_1(300-T)}{l_1}$ — (1)

For copper rod $\frac{\Delta Q}{\Delta t} = K_2 \frac{A_2(T-0)}{l_2}$ — (2)

$$K_1 \frac{A_1(300-T)}{l_1} = K_2 \frac{A_2(T-0)}{l_2}$$

$$50.2 \times \frac{2A_2(300-T)}{15 \times 10^{-2}} = 385 \frac{A_2(T-0)}{10 \times 10^{-2}}$$

$$\frac{50.2 \times 2(300-T)}{15} = \frac{385T}{10}$$

$$\frac{50.2 \times 2(300-T)}{3} = \frac{385T}{2}$$

$$200.8(300-T) = 3 \times 385T$$

$$60240 - 200.8T = 1155T$$

$$60240 = 1355.8T \Rightarrow T = \frac{60240}{1355.8}\ ^\circ C$$

$$T = 44.43^\circ C$$

$$T \approx 44^\circ C$$