Q1) Concentration at a depth $x$ at time $t$ can be given by :

$$c(x, t) = A + B \operatorname{erf}\left(\frac{x}{2\sqrt{Dt}}\right) ;$$

We know that : $c(0, t) = c_s = A$ , $c(x, 0) = c_i = 0$

also $c(\infty, t) = c_i = 0 = A + B \rightarrow A = -B$

$$\therefore \quad c(x, t) = c_b - c_b \operatorname{erf}\left(\frac{x}{2\sqrt{Dt}}\right) = c_b \operatorname{erfc}\left(\frac{x}{2\sqrt{Dt}}\right)$$

$$\rightarrow \quad 5 \times 10^{16} = c_b \operatorname{erfc}\left(\frac{25 \times 10^{-4}}{2\sqrt{7.23 \times 10^{-9} \times 90 \times 60}}\right)$$

$$\therefore \quad \operatorname{erfc}(0.20) = 1 - \operatorname{erf}(0.20) = 1 - 0.2227 = 0.7773$$

$$c_b \simeq \frac{5 \times 10^{16}}{\operatorname{erfc}(0.20)} = \frac{5 \times 10^{16}}{0.7773} = 6.43 \times 10^{16} \ cm^{-3}$$