Quiz-10   Solution

Constant surface temperature ($T_s = $ constant)

(fully developed and Laminar)

$$Nu_D = 3.66 = \frac{\bar{h}D}{k} \qquad \text{where} \qquad k = \frac{\mu \cdot C_p}{Pr}$$

(Internal flow slides pg.91)

Therefore $\bar{h}$ can be

found as $\bar{h} = \dfrac{Nu_D \cdot k}{D}$

$$\frac{T_\infty - T_{m,o}}{T_\infty - T_{m,i}} = \exp\left(\frac{-PL\bar{h}}{\dot{m}C_p}\right)$$

Everything is known except $T_{m,o}$

Solve for $T_{m,o}$