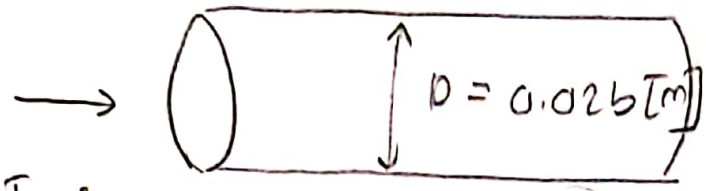

$\dot{m} = 0.35$ [kg/s]

$C_{p\,water} = 4000$ [J/kgK]

$\bar{h} = 800$ [W/m²K]

T_s = constant,

$$\frac{T_s - T_{m,o}}{T_s - T_{m,i}} = \exp\left(-\frac{PL\bar{h}}{\dot{m}C_p}\right) \quad \text{and} \quad P = 2\pi r = \pi D$$

$$\frac{400 - 396}{400 - 316} = \exp\left(-\frac{\pi \cdot 0.025 \cdot L \cdot 800}{0.35 \times 4000}\right)$$

$$\ln\left(\frac{400 - 396}{400 - 316}\right) \times -\frac{(0.35 \times 4000)}{\pi \times 0.025 \times 800} = L$$