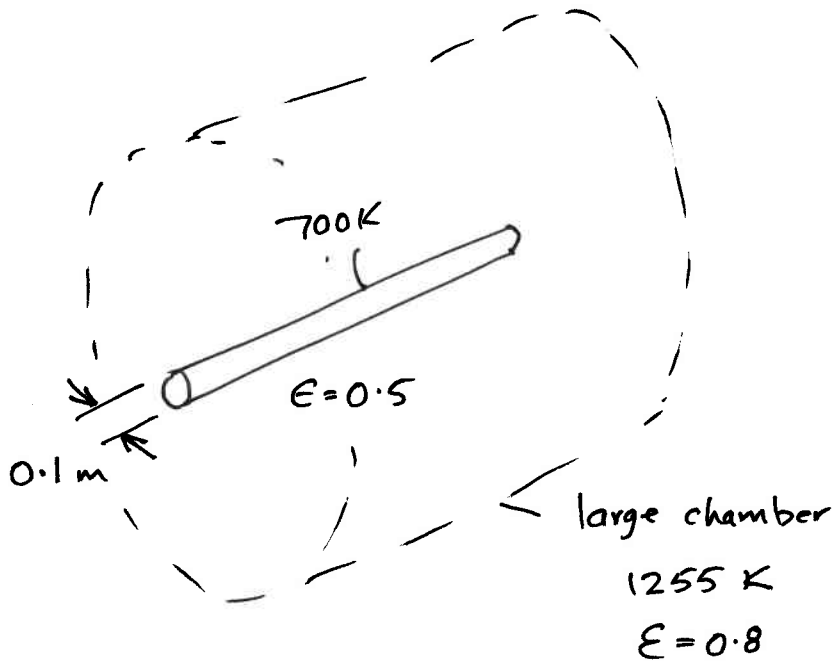


Que.4 (i)



Even though the chamber has an emissivity of 0.8 because it is large it will absorb all the radiation falling on it from the much smaller nickel tube. It may therefore be regarded as a black body completely surrounding the nickel tube.

$$\begin{aligned} \dot{Q}' &= \epsilon \sigma A (T_1^4 - T_2^4) \\ &= 0.5 \times 5.67 \times 10^{-8} \times \pi \times 0.1 (700^4 - 1255^4) \\ &= -19960 \text{ W/m} \end{aligned}$$

∴ 19.96 kW/m (received from the chamber walls)