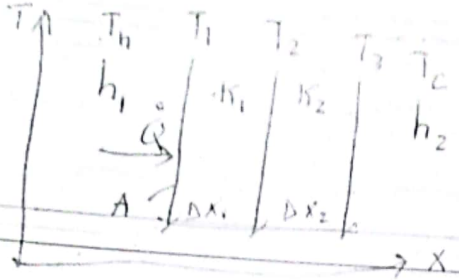
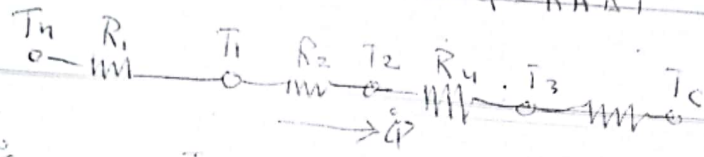
25/24





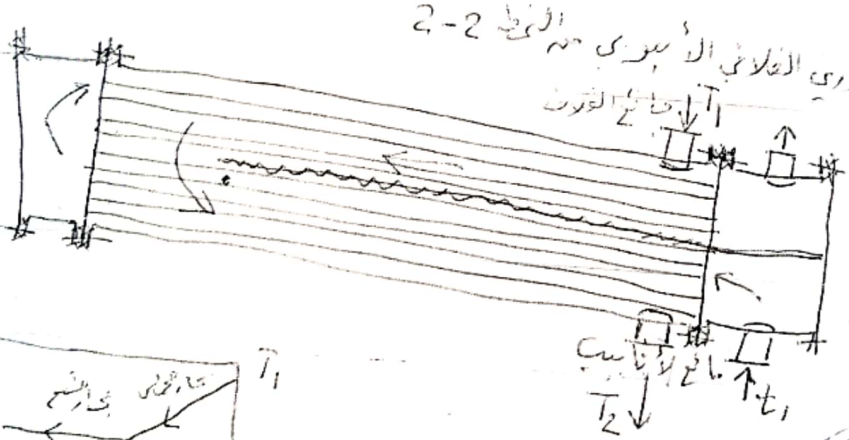
$$\dot{Q} = \frac{T_h - T_c}{\frac{1}{h_1 A} + \frac{\Delta x_1}{K_1 A} + \frac{\Delta x_2}{K_2 A} + \frac{1}{h_2 A}}$$

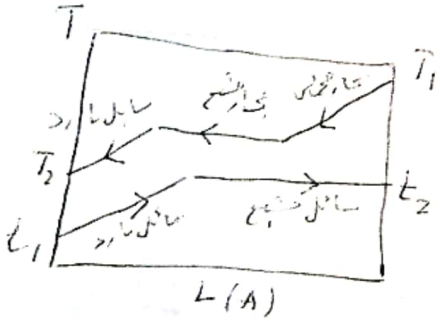
* عامل زيادة يزيد بحاي: $\dot{Q}$ - تزيد بشكل
* عامل زيادة يزيد بحاي: $A \leftarrow$ تزيد $\dot{Q}$ - تزيد بشكل
* عامل زيادة يزيد بحاي: $\Delta x \leftarrow$ تزيد $\dot{Q}$ - تزيد بشكل

$$\dot{Q} = \frac{T_1 - T_2}{\Delta x_1 / K_1 A} \Rightarrow T_1 - T_2 = \dot{Q}(\Delta x_1 / K_1 A) \Rightarrow$$

$$\Rightarrow \boxed{T_2 = T_1 - \dot{Q}\frac{\Delta x_1}{K_1 A}}$$

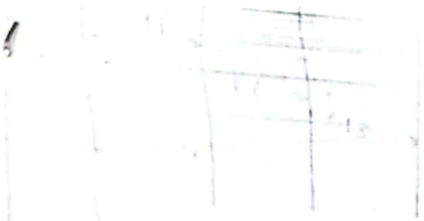
السؤال الثاني (25) درجة





الممسوحة ضوئيا بـ CamScanner

السؤال الثاني (20)



$r_1 = 2.1\,cm$ $\quad k_1 = 43\ W/m.K$

$r_2 = 2.3.5\,cm$ $\quad k_2 = 0.04\ W/m.K$

$r_3 = 4.0\,cm$ $\quad h_o = 6\ W/m^2K$

$h_i = 12,000\ W/m^2.K$

$T_i = T_o$ $\qquad$ $T_1 - T_o$

$$\frac{1}{h_i A_i} + \frac{1}{2\pi k_1} \ln\frac{r_1}{r_i} + \frac{1}{2\pi k_2} \ln\frac{r_2}{r_1} + \frac{1}{h_o A_o}$$

$R_1 + R_2 + R_3 + R_4$

$$R_1 = \frac{1}{h_i A_i} = \frac{1}{12,000(2\pi r_1)} = \frac{1}{12,000(2\pi \times 0.021)} \simeq 6.3 \times 10^{-4}\ K/W$$

$$R_2 = \frac{1}{2\pi k_1} \ln\frac{r_2}{r_1} = \frac{1}{2\pi(43)} \ln\frac{2.3}{2.1} = 3.37 \times 10^{-4}\ K/W$$

$$R_3 = \frac{1}{2\pi k_2} \ln\frac{r_3}{r_2} = \frac{1}{2\pi(0.04)} \ln\frac{4}{2.3} = 2.2\ K/W$$

$$R_4 = \frac{1}{h_o A_o} = \frac{1}{6(2\pi r_3)} = \frac{1}{6(2\pi \times 0.04)} = 0.6631\ K/W$$

$$R_{tot} = R_1 + R_2 + R_3 + R_4 = 6.3 \times 10^{-4} + 3.3 \times 10^{-4} + 2.2 + 0.6631$$

$$R_{tot} = 2.864\ K/W$$

$$Q_L = \frac{\Delta T_{ov}}{R_{tot}} = \frac{120 - 25}{2.864} = \frac{160}{2.864} = 54\ W/m$$

$$\boxed{Q_L = 54\ W/m}$$

الممسوحة ضوئيا بـ CamScanner