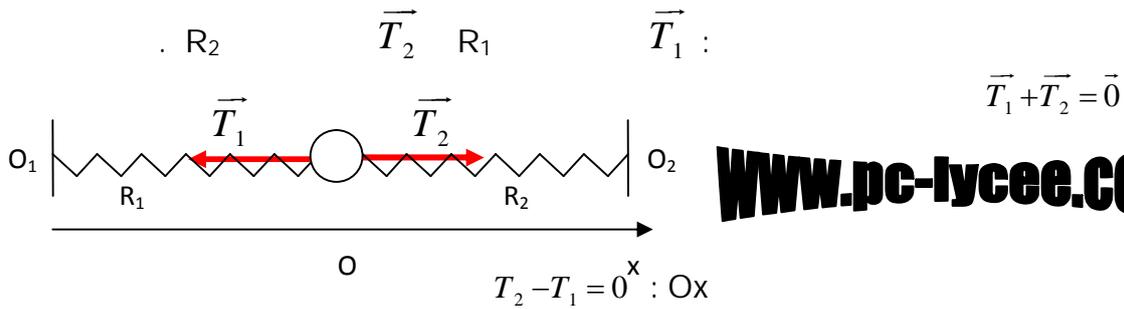


07



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$$T_2 = k_2(l_2 - l_{02}) \quad T_1 = k_1(l_1 - l_{01})$$

$$k_2(l_2 - l_{02}) - k_1(l_1 - l_{01}) = 0$$

$$O_1O_2 = l_1 + l_2 + 2r :$$

Mohammed Sobhi

$$\begin{cases} k_2(l_2 - l_{02}) - k_1(l_1 - l_{01}) = 0 & (1) \\ O_1O_2 = l_1 + l_2 + 2r & (2) \end{cases}$$

$$\begin{cases} (1) \Rightarrow l_2 = \frac{k_1}{k_2}(l_1 - l_{01}) + l_{02} \\ (2) \Rightarrow l_2 = O_1O_2 - l_1 - 2r \end{cases}$$

$$\frac{k_1}{k_2}(l_1 - l_{01}) + l_{02} = O_1O_2 - l_1 - 2r \Rightarrow l_1 \left(\frac{k_1}{k_2} + 1 \right) = O_1O_2 + l_{01} \frac{k_1}{k_2} - l_{02} - 2r$$

$$\frac{k_1}{k_2}(l_1 - l_{01}) + l_{02} = O_1O_2 - l_1 - 2r \Rightarrow l_1 \left(\frac{k_1}{k_2} + 1 \right) = O_1O_2 + l_{01} \frac{k_1}{k_2} - l_{02} - 2r$$

$$k_1 = \frac{1}{10^{-2}} = 100 \text{ N} \cdot \text{m}^{-1} \quad k_1$$

$$k_2 = \frac{1}{4 \cdot 10^{-2}} = 25 \text{ N} \cdot \text{m}^{-1} \quad k_2$$

$$\Rightarrow l_1 = \frac{O_1O_2 + l_{01} \frac{k_1}{k_2} - l_{02} - 2r}{\left(\frac{k_1}{k_2} + 1 \right)}$$

$$l_1 = \frac{30 + 10 \times \frac{100}{25} - 15 - 2}{\left(\frac{100}{25} + 1 \right)} \Rightarrow l_1 = 10,6 \text{ cm} :$$

$$(2) \Rightarrow l_2 = O_1O_2 - l_1 - 2r \Rightarrow l_2 = 30 - 10,6 - 2 \Rightarrow l_2 = 17,4 \text{ cm}$$

$$T_1 = T_2 = T$$

$$T = k_1 \Delta l_1 = k_1(l_1 - l_{01})$$

$$T = 100(10,6 - 10) \cdot 10^{-2} \Rightarrow T = 0,6 \text{ N} :$$

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