4 A sample of material has cross-sectional area A and length L. The temperatures at the two sides of the sample are T_1 and T_2. Thermal energy Q is transferred through the sample in time t.

These quantities are related by

$$\frac{Q}{t} = \frac{k \times A \times (T_1 - T_2)}{L}$$

where k is a constant.

What are the SI base units of k?

A $\text{kg m s}^{-3} \,^\circ\text{C}^{-1}$ **B** $\text{kg m s}^{-3} \text{K}^{-1}$ **C** $\text{kg m s}^{-1} \,^\circ\text{C}^{-1}$ **D** $\text{kg m s}^{-1} \text{K}^{-1}$