First find fin efficiency assuming short fin

$$m = \sqrt{\frac{hp}{\lambda A}} = \sqrt{\frac{26 \quad (150\times2+5\times2)\times10^{-3}}{1{\cdot}27 \quad (150\times5)\times10^{-6}}} = 92 \ m^{-1}$$

$$L = 30\times10^{-3} \ m \qquad \therefore \quad mL = 30\times10^{-3}\times92 = 2{\cdot}76$$

$$\frac{h}{\lambda m} = \frac{26}{1{\cdot}27\times92} = 0{\cdot}223$$

$$\eta_{fin} = \frac{\tanh mL + \frac{h}{\lambda m}}{\left(1+\frac{h}{\lambda m}\tanh mL\right)\left(\frac{h}{\lambda m}+mL\right)}$$

$$= \frac{\tanh 2{\cdot}76 + 0{\cdot}223}{(1+0{\cdot}223\tanh 2{\cdot}76)(0{\cdot}223+2{\cdot}76)} = \underline{0{\cdot}334}$$

Area weighted fin efficiency $\eta' = 1 - \beta(1-\eta_{fin})$

where $\beta = \dfrac{A_{fin}}{A_{total}} = \dfrac{(30+30+5)\times150}{(30+30+5)\times150 + (30-5)\times150} = 0{\cdot}722$

$$\eta' = 1 - 0{\cdot}722\,(1-0{\cdot}334) = 0{\cdot}519 \text{ or } \underline{\underline{52\%}}$$

i.e. a tripling of surface area has resulted in only a 55% increase in heat transfer rate

$(3\times0{\cdot}519 = 1{\cdot}\underline{\underline{55}}6)$