12.1 Given \( T = 2500^\circ \text{C} \), what is the wavelength of maximum emission?

\[
\lambda = \frac{a}{T} = \frac{2.9 \times 10^6 \text{ nm K}}{(2500 + 273) \text{ K}}
\]

\[
\lambda = 2.9 \times 10^6 \text{ nm} = 1046 \text{ nm} = 1.05 \mu\text{m}
\]

\( \lambda = 1.05 \mu\text{m} \) peaks in the near-IR.

12.3 A glow-worm emits at 650 nm. If a glow-worm is a hot source, what is the temperature? State the problem.

Give the formulas used:

\[
\lambda = \frac{a}{T} = \frac{T}{\lambda}
\]

\[
T = \frac{2.9 \times 10^6 \text{ nm K}}{650 \text{ nm}} = 4461 \text{ K}
\]

\( T = 4500 \text{ K} \)

A glow-worm is not a hot body emitting. The light must be produced by some other mechanism.

Neatness counts. Write clearly, recopy your work if necessary.