33.68. **Model:** Assume any resistance is negligible.
Visualize: The potential difference across the inductor and capacitor oscillate. The period of oscillation depends on the resistance and capacitance and the potential difference across the capacitor depends on the charge.
Solve: The current is $I(t) = I_0 \cos \omega t = (0.60 \text{ A}) \cos \omega t$. We can relate the extreme values of the current and the capacitor potential difference. Using $\omega = 1/\sqrt{LC}$ and $Q = C\Delta V_C$, we find

$$I_0 = \omega Q_0 = \omega C \Delta V_{C,max} = \frac{1}{\sqrt{LC}} C \Delta V_{C,max} \Rightarrow C = \frac{I_0^2 L}{\Delta V_{C,max}^2} = \frac{(0.60 \text{ A})^2 (10 \times 10^{-3} \text{ H})}{(60 \text{ V})^2} = 1.0 \, \mu F$$

Assess: This is a reasonable capacitance.