Given: A network containing a battery $\mathcal{E}$, and capacitor $C$, and resistor $R$ and an inductor $L$.

![Circuit Diagram]

Denote the angular frequency of the “$LC$” circuit by $\omega = \frac{1}{\sqrt{(L/C)}}$.

The switch $S$ is left at position $a$ for a long period of time. The switch $S$ is then moved from position $a$ to $b$ at $t = 0$.

Find the current through the inductor $L$.

A) $I = I_{\text{max}} \cos \omega t$

B) $I = I_{\text{max}} \sin \omega t$

C) $I = I_{\text{max}} \cos \left(\omega t + \frac{\pi}{4}\right)$

D) $I = I_{\text{max}} \sin \left(\omega t + \frac{\pi}{4}\right)$
Since the current is maximum at $t = 0$, the only satisfactory choice is $I = I_{\text{max}} \cos \omega t$.

Answer A.