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

![Diagram of an RLC circuit]

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

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

Since the current is maximum at $t = 0$, the only satisfactory choice is $I = I_{max} \cos \omega t$.

Answer A.

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