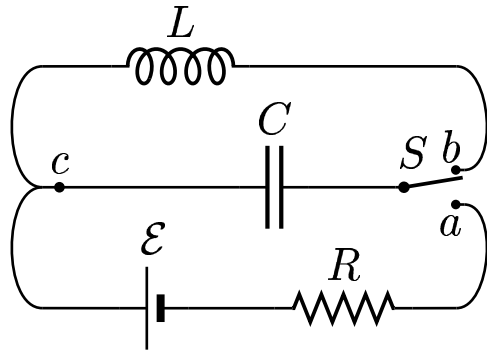


Given: A network containing a battery \mathcal{E} , and capacitor C , and resistor R and an inductor L .



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 plate charge on the capacitor C .

- A) $Q = \mathcal{E} C \sin \omega t$
- B) $Q = \mathcal{E} C \cos \omega t$
- C) $Q = \frac{\mathcal{E}}{C} \sin \omega t$
- D) $Q = \frac{\mathcal{E}}{C} \cos \omega t$

Since the charge is maximum at $t = 0$, $Q = V C$, and $V = \mathcal{E} C$, we have

$$Q = \mathcal{E} C \cos \omega t .$$

Answer **B**.

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