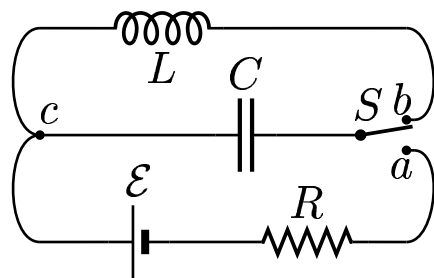


Given: A network containing a battery \mathcal{E} , and capacitor C , and resistor R and an inductor L .



The switch S is left at position a for a long period of time and the capacitor's charge becomes Q_{max} .

When the switch S is moved to position b , find the maximum current I_{max} which passes through the inductor L .

- A) $I_{max} = Q_{max} \sqrt{\frac{C}{L}}$
- B) $I_{max} = Q_{max} \sqrt{\frac{L}{C}}$
- C) $I_{max} = Q_{max} \sqrt{LC}$
- D) $I_{max} = \frac{Q_{max}}{\sqrt{LC}}$

From energy considerations, we have

$$U = U_C + U_L = U_{C_{max}} = U_{L_{max}}, \quad \text{where}$$

$$U_C = \frac{Q^2}{2C} \quad \text{and} \quad U_L = \frac{L I^2}{2}.$$

$$U = U_{C_{max}} = \frac{Q_{max}^2}{2C} = U_{L_{max}} = \frac{L I_{max}^2}{2}, \quad \text{therefore}$$

$$I_{max} = \frac{Q_{max}}{\sqrt{LC}}.$$

Answer **D**.

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