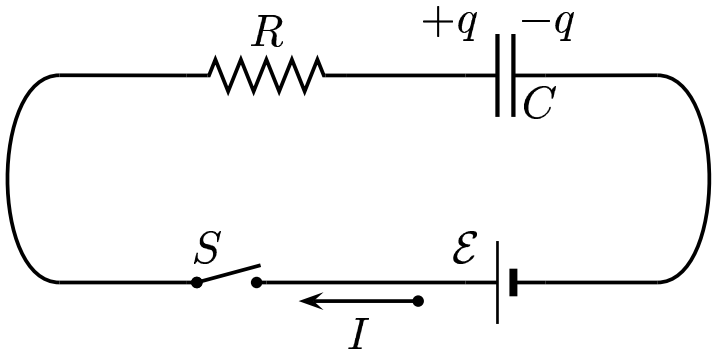
Consider the RC circuit shown.

The loop equation is given by $\mathcal{E} - \dfrac{q}{C} - i\,R = 0\,.$



Determine Q and I immediately after closing S at $t = 0$.

A) $Q_0 = 0$ and $I_0 = \dfrac{\mathcal{E}}{R}$

B) $Q_0 = 0$ and $I_0 = \mathcal{E}\,R$

C) $Q_0 = \mathcal{E}\,C$ and $I_0 = \dfrac{\mathcal{E}}{R}$

D) $Q_0 = \mathcal{E}\,C$ and $I_0 = \mathcal{E}\,R$

The present case corresponds to charging a capacitor. There is no charge initially; *i.e.*, at $t = 0$, $Q = Q_0 = 0$. From the loop equation $I = I_0 = \dfrac{\mathcal{E}}{R}$.

Answer **A**.

28.04-02˙RC˙Circuit˙Charging 2004-3-24