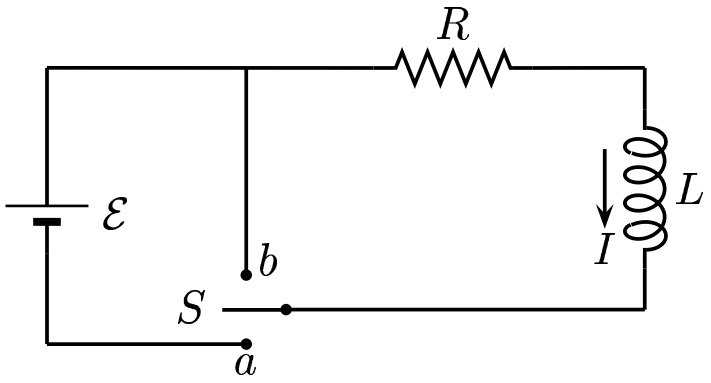
Leave S in "a" to build up I in L to I_{max}. Then at some new time $t = t_1$, switch S from "a" to "b".



Determine total dissipation energy in the time interval from $t = t_1$ to a very large time, $t = \infty$.

A) The energy dissipated is $\frac{L}{2}\left(\frac{\mathcal{E}}{R}\right)^2$.

B) The energy dissipated is $\frac{\mathcal{E}^2}{R}$.

C) 0

The maximum current built up when S is at the position "a" is: $I_{max} = \frac{\mathcal{E}}{R}$. Correspondingly, the total energy stored in L at the maximum current is:

$$U_L = \frac{1}{2} I_{max}^2 L = \frac{L}{2} \left(\frac{\mathcal{E}}{R} \right)^2 .$$

The energy stored at the maximum current will totally be dissipated. In other words, the total dissipation energy equals $\frac{L}{2} \left(\frac{\mathcal{E}}{R} \right)^2$ also.

Answer **A**.

32.03-01˙Dissipation˙in˙RL˙Circuit 2004-3-24