

Problem 16

A series circuit has a capacitor of 0.25×10^{-6} F, a resistor of $5 \times 10^3 \Omega$, and an inductor of 1 H. The initial charge on the capacitor is zero. If a 12-volt battery is connected to the circuit and the circuit is closed at $t = 0$, determine the charge on the capacitor at $t = 0.001$ s, at $t = 0.01$ s, and at any time t . Also determine the limiting charge as $t \rightarrow \infty$.