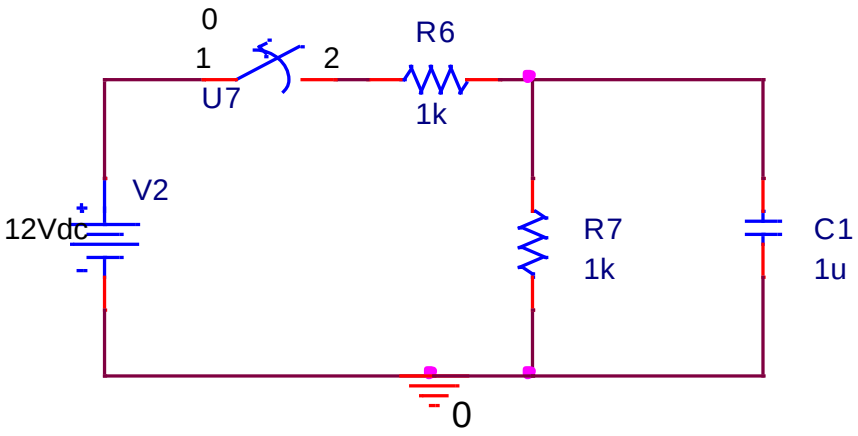
Problem

Given the circuit in next figure, where for t < 0 seconds, the switch U7 has been closed during a long time. At t = 0 seconds the switch is opened. (a) Find the time constant τ of the resulting circuit (3 points), (b) Find the equation of the voltage at the capacitor for t >= 0 s (5 points), and (c) Compute the value and direction of the current at t = τ seconds (2 points). (All Resistances in kohms and capacitances in microFarads).



(a) $\tau = 1k\Omega \cdot 1\mu F = 1ms$

(b) $v(t) = 6 \cdot e^{-\frac{t}{1ms}} V. = 6 \cdot e^{-1000t} V.$

(c) $i(t) = \frac{6}{1K\Omega} e^{-1000t}$ " $i(\tau) = \frac{6}{1K\Omega} \frac{1}{e} A = 2,21 mA$

Counterclockwise