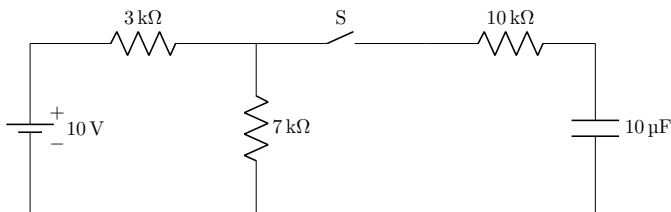


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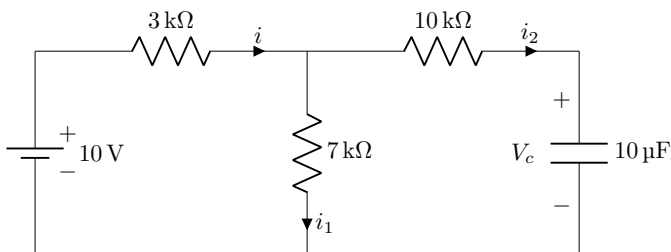
EE23BTECH11007 - Aneesh Kadiyala*

Question: In the following circuit, the switch S is open for $t < 0$ and closed for $t \geq 0$. What is the steady state voltage (in Volts) across the capacitor when the switch is closed?



Solution:

For $t \geq 0$:



In steady state, no current flows through capacitor.

$$i_2 = 0 \quad (1)$$

$$\Rightarrow i = i_1 \quad (2)$$

$$V_c = (7\text{k}\Omega)(i_1) \quad (3)$$

$$10\text{V} = (10\text{k}\Omega)(i_1) \quad (4)$$

$$\Rightarrow i_1 = 1\text{mA} \quad (5)$$

$$V_c = 7\text{V} \quad (6)$$