電路學(EE2210)第五次隨堂考
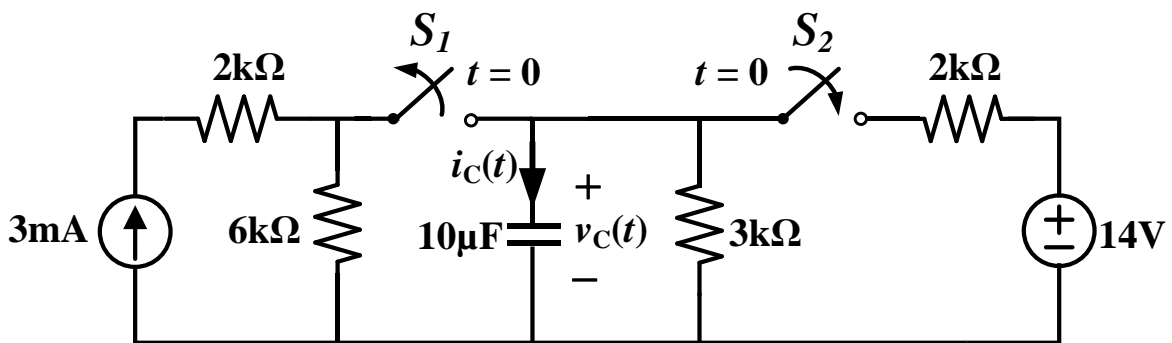
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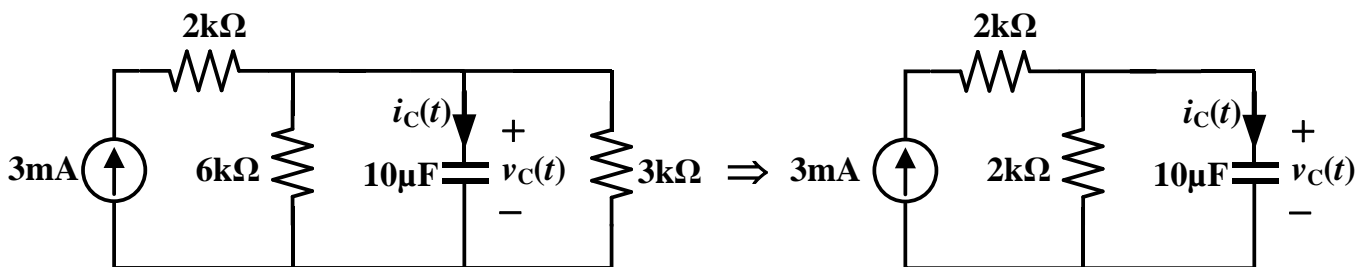姓名：_____

For the circuit as shown in the following figure, the switch S_1 has been closed for a long time before it is opened at $t = 0$ and the switch S_2 has been opened for a long time before it is closed at $t = 0$. Find $v_C(0^+)$ and $i_C(0^+)$.
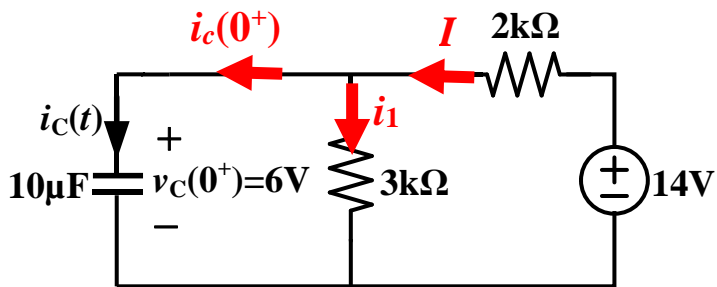

Solutions:

Because the switch S_2 has been closed for a long time before $t = 0$, the capacitor can be regarded as opened terminal, the equivalent circuit is

$$v_C(0^+) = v_C(0^-) = 3m\text{A} \times 2\text{k}\Omega = 6\text{V}$$

After the switch S_2 is closed at $t = 0$, and switch S_1 is opened, the equivalent circuit is

$$i_1 = \frac{6V}{2k\Omega} = 2mA$$

$$I = \frac{14V - 6V}{2k\Omega} = 4mA$$

$$i_c(0^+) = 4 - 2 = 2mA$$

$v_C(0^+) =$ _____ 6V _____, $i_C(0^+) =$ _____ 2mA _____.