

電路學(EE2210)第六次隨堂考

2015年11月04日

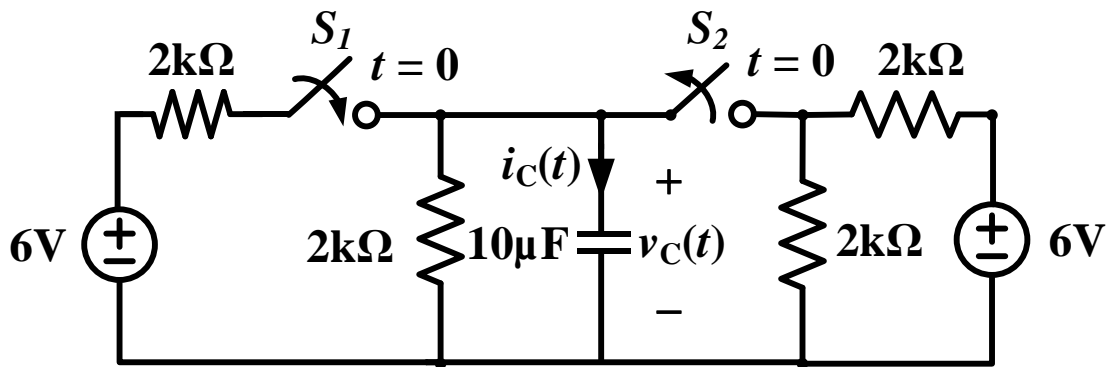
時間：10 分鐘

Close Book

學號： _____

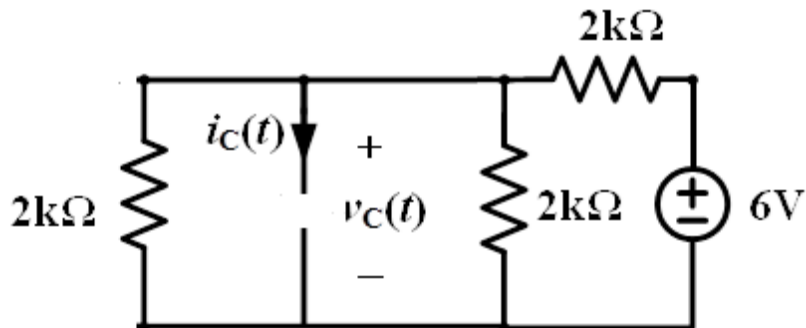
姓名： _____

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



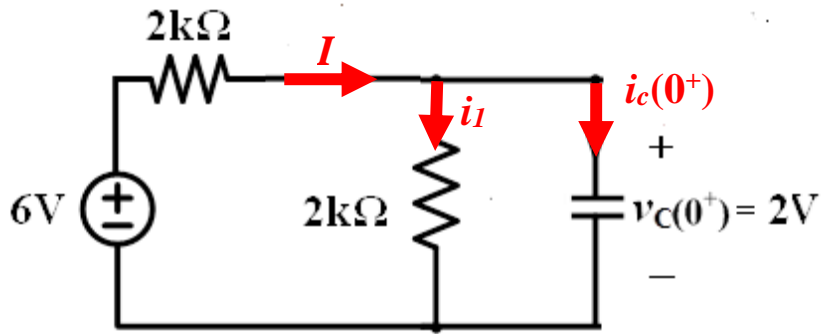
Solutions:

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



$$v_C(0^-) = 6 \times \frac{1}{2//2k + 2k} = 2V$$

At $t = 0$, the switch S_2 is opened, and switch S_1 is closed, the equivalent circuit become



$$v_C(0^+) = v_C(0^-) = 2V$$

$$I = \frac{6 - v_C(0^+)}{2k\Omega} = \frac{6 - 2}{2k\Omega} = 2mA$$

$$i_1 = \frac{v_C(0^+)}{2k\Omega} = \frac{2}{2k\Omega} = 1mA$$

$$i_C(0^+) = I - i_1 = 2 - 1 = 1mA$$

$v_C(0^+) = \underline{\hspace{10em}} 10V \underline{\hspace{1em}}, i_C(0^+) = \underline{\hspace{10em}} 1mA \underline{\hspace{1em}}.$
