

Homework 4

Due date: 1pm, Nov. 16th, 2023

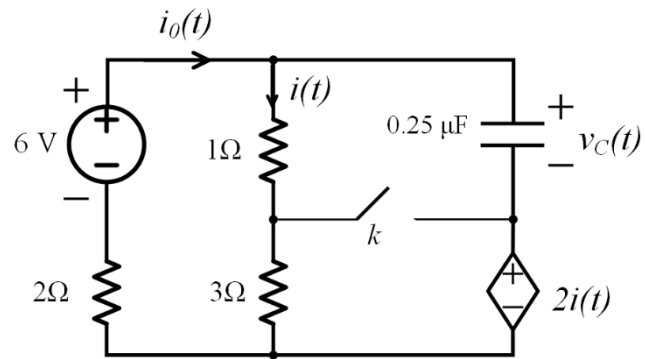
Turn in your hard-copy hand-writing homework to Room 324 #3 SIST

信息学院 3 号楼 324

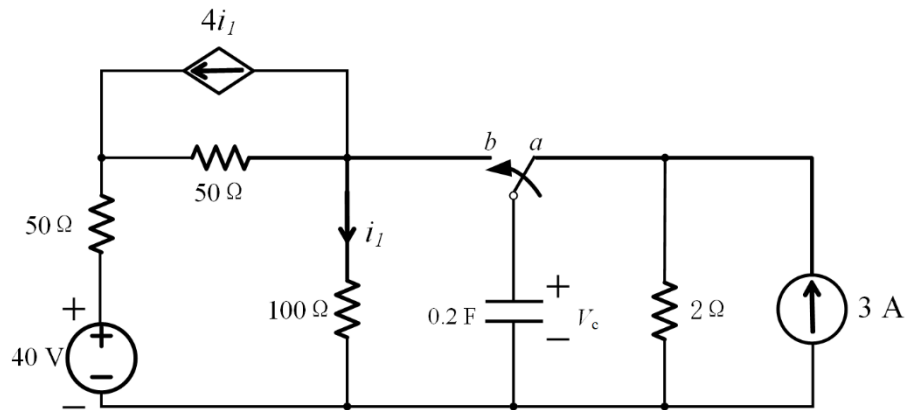
Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.
- Please show all intermediate steps: a correct solution without an explanation will get zero credit.
- Please submit on time. No late submission will be accepted.
- Please prepare your submission in English only. No Chinese submission will be accepted.

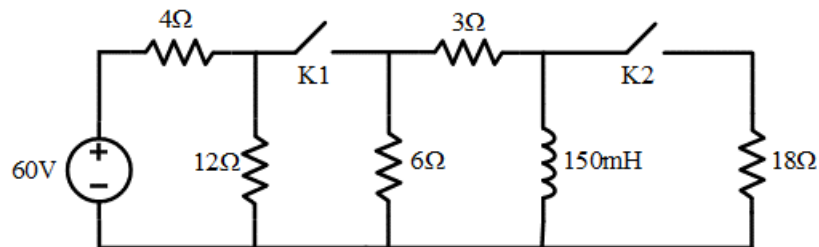
1. For the circuit below, the switch k has been open for a long time. The switch is closed at $t = 0$ s immediately. Determine $i_o(t)$, $i(t)$ and $v_C(t)$ in the circuit for $t > 0$.



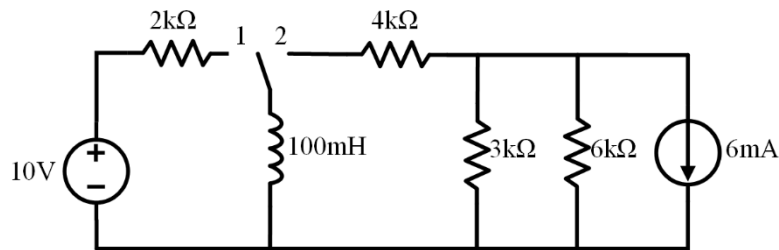
2. When $t=0$ s, the switch changes from *node a* to *node b* immediately. Assume that the circuit reaches steady state before $t=0$. Determine $v_c(t)$, in the circuit for $t > 0$.



- 3.
- assuming that K1 and K2 have been closed for a long time, K1 opens at $t=0$ and K2 opens at $t=35\text{ms}$, calculate the inductance currents for $t > 0$.
 - What is the ratio between energy consumed by the 18Ω resistor and energy stored in the inductor?



- 4.
- The switch has been placed at terminal 2 for a long time. When $t=0$, the switch is placed at terminal 1. Calculate the inductance current at $t=0.6ms$.
 - If at $t=0.6ms$, the switch was placed back to terminal 2. Calculate the inductance current for $t > 0.6ms$.



5.

When $t < 0$, the switch is set to terminal 1 and the circuit reaches steady state.

When $t > 0$, the switch is set to terminal 2. Calculate the capacitance voltage for $t > 0$.

