

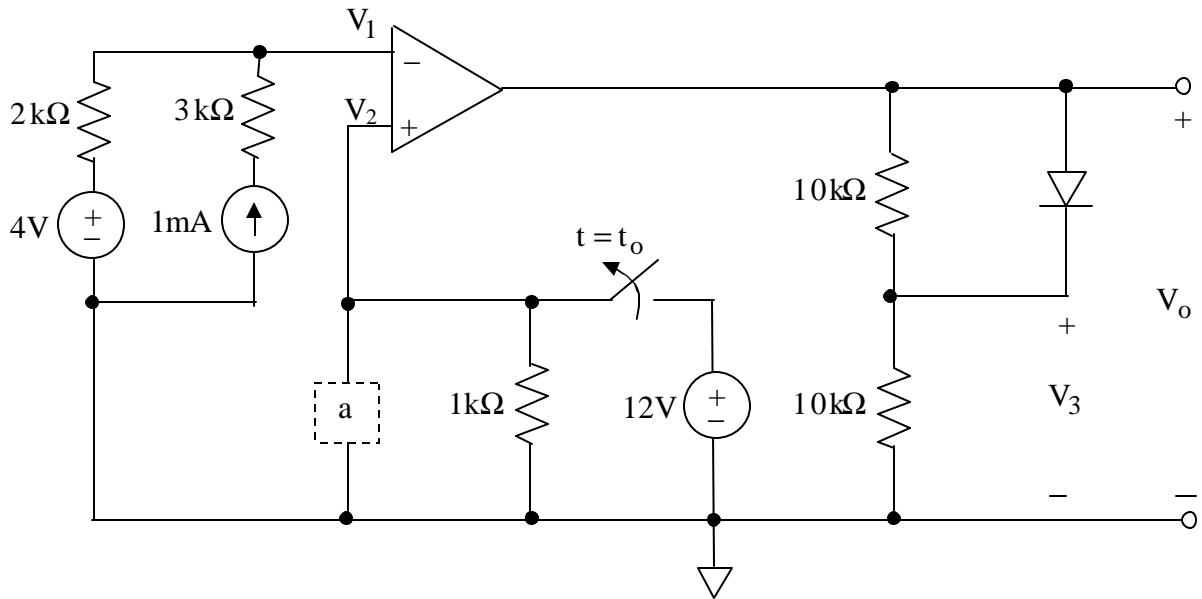
UNIVERSITY OF UTAH
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

ECE 1270

HOMEWORK #10

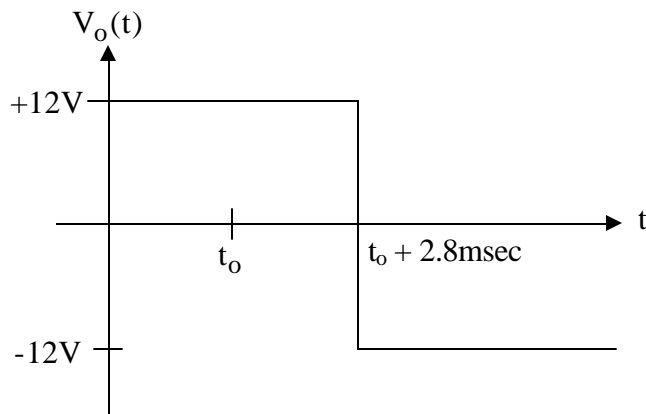
Spring 2008

1.



Rail voltages = ± 12 V

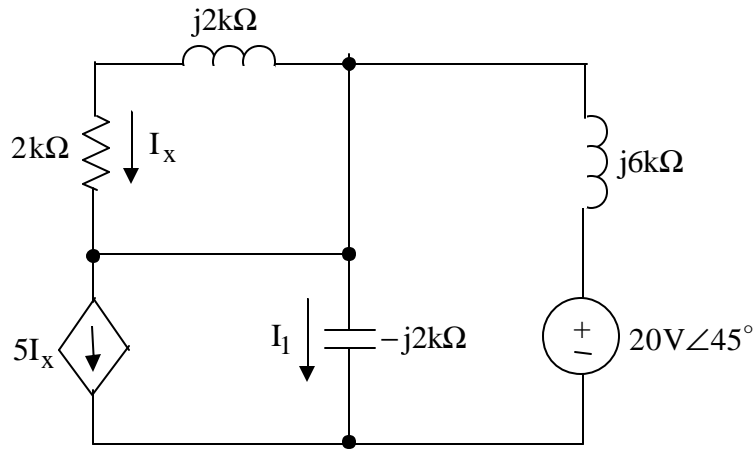
After being closed for a long time, the switch opens at $t = t_0$.



- a) Choose either an R, C, or L to go in box **a** to produce the $V_0(t)$ shown above. Specify which element goes in the box and its value. **Hint: It is not possible to have two different voltages at the same node.**
- b) Sketch $v_1(t)$, showing numerical values appropriately.

2. a) Sketch $v_2(t)$, showing numerical values appropriately.
- b) Sketch $v_3(t)$. Show numerical values for $t < t_0$, for $t_0 < t < t_0 + 2.8\text{ms}$, and for $t > t_0 + 2.8\text{ms}$. Use the ideal model of the diode: when forward biased, its resistance is zero; when reverse biased, its resistance is infinite.

3.



- a) A frequency-domain circuit is shown above. Write the value of phasor \mathbf{I}_1 in polar form.
- b) Given $\omega = 52 \text{ rad/s}$, write a numerical time-domain expression for $i_1(t)$, the inverse phasor of \mathbf{I}_1 .