ECE 35, Fall 2017

Quiz 3 - Section A

Last name	
First + middle name(s)	
PID	

Instructions:

- Read each problem completely and thoroughly before beginning
- All calculations need to be done on these sheets
- Write your answers in the answer boxes for each question. Make sure you list units!
- Answers without supporting calculations will receive zero credit

(1) Consider the system below (it is repeated on the next page). For $t < 0$, the switch is closed. At $t = 0$, the switch is opened and it remains open. At time $t = 0^-$, just before the switch was opened, the system was not in steady state, but it is given that $\boldsymbol{v_C(0^-) = 1V}$ and $\boldsymbol{i_L(0^-) = 2A}$.

(a) What is the energy in the capacitor at time $\boldsymbol{t = 0^+}$, (right after the switch is opened)?

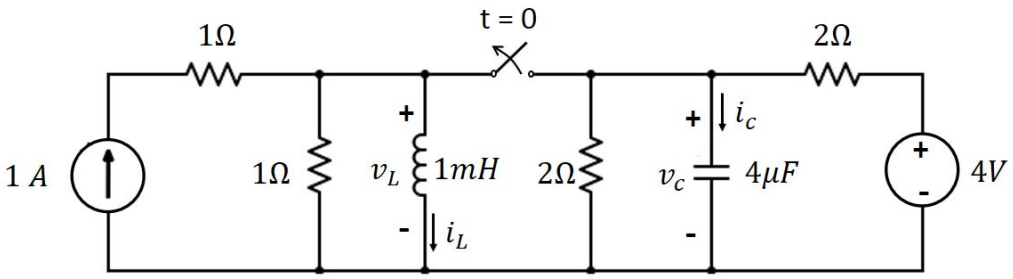
(b) Find the expression for the inductor voltage $\boldsymbol{v_L(t)}$, for $t > 0$.

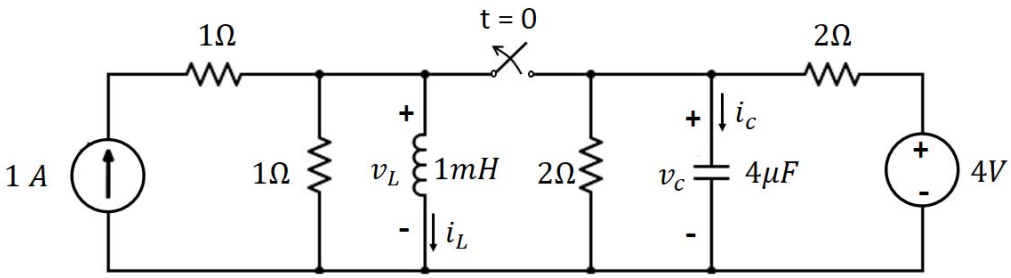
$\boldsymbol{v_L(t)}$ **in V =**

(c) At time $t = 1000$, the switch is closed again. Find the capacitor voltage $\boldsymbol{v_C}$ and the inductor current $\boldsymbol{i_L}$ at time $\boldsymbol{t = \infty}$.

$\boldsymbol{v_C}$

$\boldsymbol{i_L}$




t = 0
1Ω
2Ω
1 A
1Ω
+
v_L
1mH
-
i_L
2Ω
+
i_c
v_c
4μF
-
+
-
4V

(2) Find $i_C(t)$. (Hint: you can use nodal analysis)