EE2210 Electric Circuits **Fall 2022**

Homework 2 (Lecture 4 – Lecture 5)

Please write down clearly the calculation/thinking process of each question. Unit is needed when applicable.

Due: Oct. 31st, 10:10am.

1. Use superposition. Determine the current $i_1(t)$ for the circuit in Figure 1. Assume $i_1(t) = 0$ A for $t < 0$. (15%)

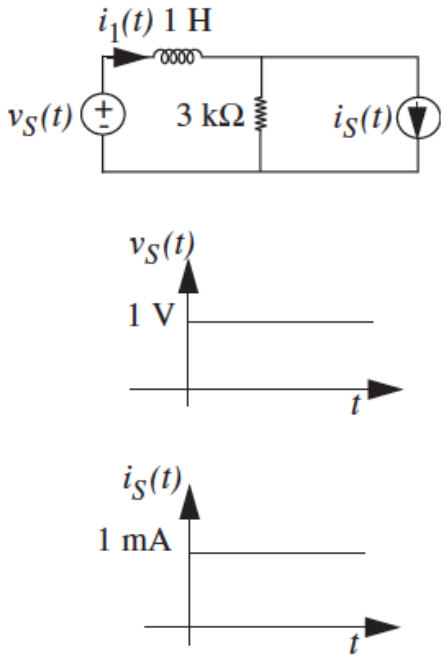

Figure 1.

2. Considering the circuit in Figure 2. The switch is closed at t = 0 and opened at t = 1 second. Determine $v_C(t)$ for all time and plot $v_C(t)$ versus time. (15%)

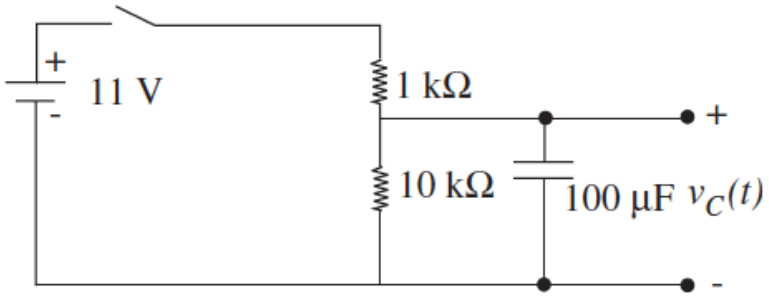

Figure 2.

3. Consider the circuit shown in Figure 3. Assume $i(t) = 3e^{-25t}$ A for t > 0. The initial voltage on the capacitor is $v_C(t=0) = -2$ V. Determine the current source voltage, $v_C(t)$, for t > 0. (10%)

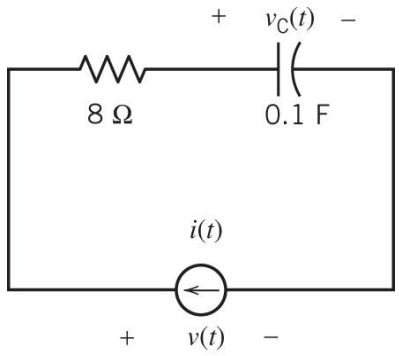

Figure 3.

4. Determine $i_L(t)$ for t > 0 when $i_L(t=0) = -2$ μA for the circuit in Figure 4(a) and $v_s(t)$ is shown in Figure 4(b). (10%)

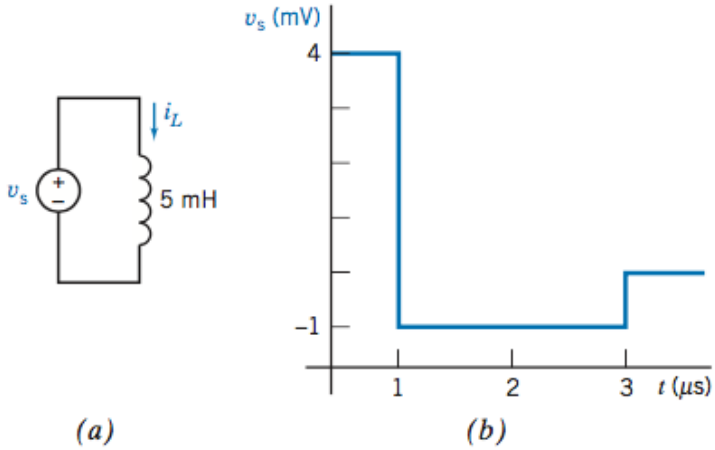

Figure 4.

5. Find the current $i(t)$ for the circuit in Figure 5. Assume the voltage source has a voltage of 10*cos(10t) V. (12%)

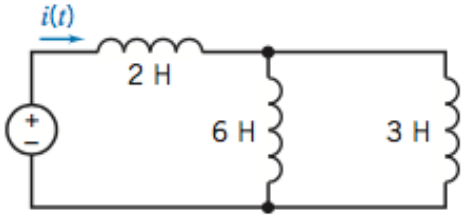

Figure 5.

6. Consider the circuit in Figure 6. Determine the energy stored in the capacitor in the

following two cases. (a) When the switch is closed and the circuit is at steady state. (b) When the switch is opened and the circuit is at steady state. (14%)

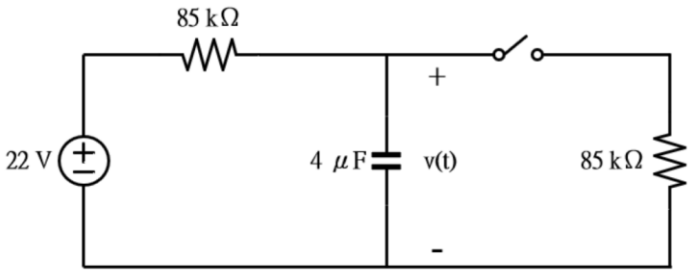

Figure 6.

7. Consider the circuit in Figure 7. Find the expression of *v(t)* for t > 0 and plot *v(t)* versus time. Assume $i(t = 0) = I_0$. (14%)

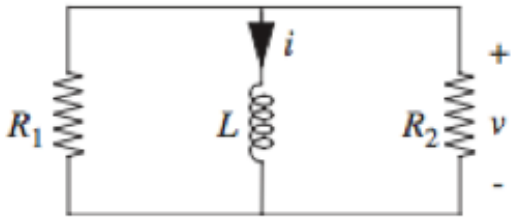

Figure 7.

8. The current *i(t)* of a 5-H inductor is: *i(t)* = 0 when t < 0 and *i(t)* = cos(100t) when t ≥ 0. Determine the power *p(t)* absorbed by the inductor and the energy *w(t)* stored in the inductor. (10%)