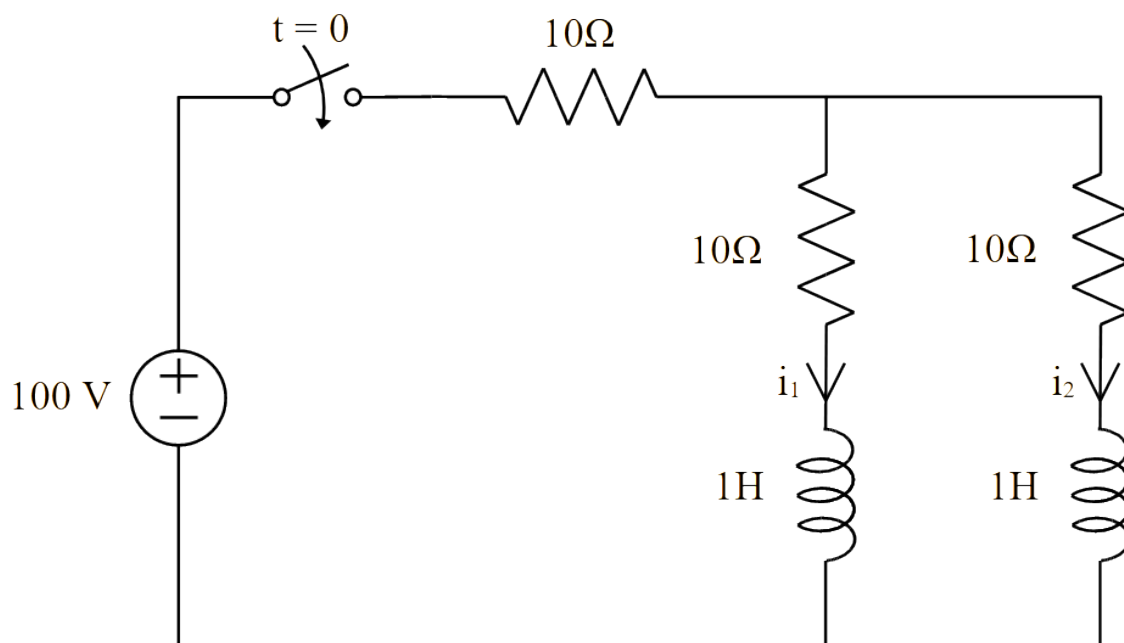
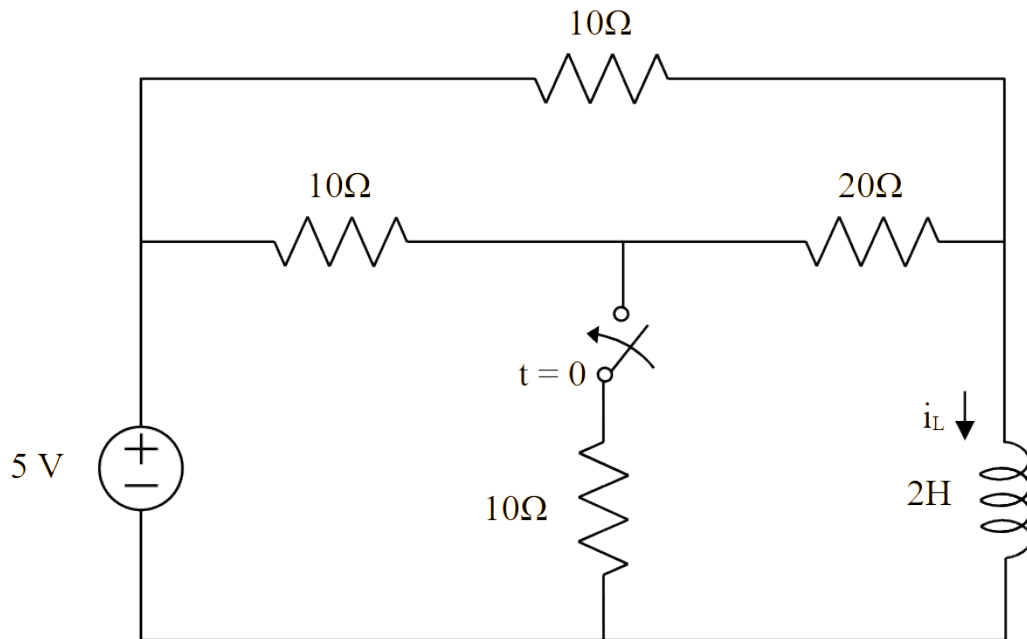


Assignment submission due date: साउन १८, २०८१ (2nd August, 2024), Friday

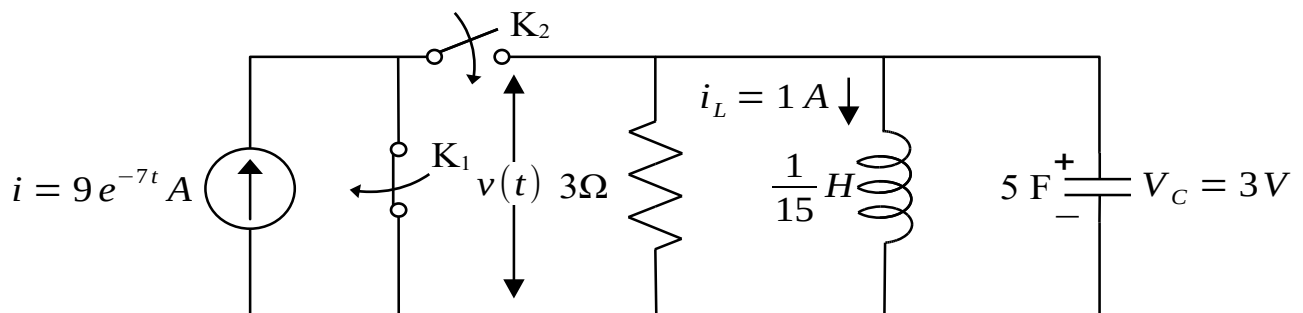
1. In a series RC circuit with $R = 1\Omega$ and $C = 1F$, the voltage source follows the law $v(t) = V e^{-\alpha t}$, where α is a constant. The switch is closed at $t = 0$.
 - i. Solve for the current assuming that $\alpha \neq 1/RC$ and
 - ii. Solve for the current when $\alpha = 1/RC$
2. A sinusoidal voltage $v(t) = 40 \sin(10^6 t + \pi/4)$ is suddenly applied at time $t = 0$ to a series RC circuit comprising of resistor $R = 2\Omega$ and capacitor $C = 1/4 F$. Obtain the complete particular solution for current through the circuit. Assume $3C$ charge across the capacitor before switching.
3. In the network shown, the switch is closed at $t = 0$, with the network previously unenergized. For the element values shown on the diagram, find $i_1(t)$ and $i_2(t)$ for $t > 0$.



4. In the network given below, the switch K is open and the network reaches a steady state. At $t = 0$, switch K is closed. Find the current in the inductor for $t > 0$.



5. In the given network, before the application of current source, the inductor and capacitor are initially energized. The switch K_1 is opened and K_2 is closed at $t = 0$. Find complete expression for voltage $v(t)$ across the network, for $t > 0$.



6. Find the current through the inductor in the network shown in figure below.

