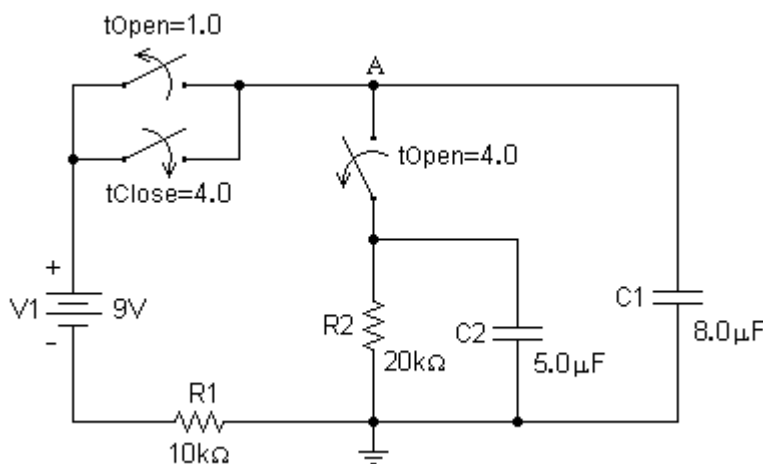


EE 206 Simulation 7

Transient Analysis

In electrical engineering, a *transient* is defined as "a phenomenon caused in a system by a sudden change of conditions, and which persists for a relatively short period of time." This simulation has two changes (caused by switches) to illustrate transient responses of an electrical circuit.

Draw the circuit in the following figure using PSpice Schematics. (Note: device "Sw_tClose" is a switch which is open until time reaches the value of the parameter "tClose". Likewise, the device "Sw_tOpen" is a switch which is closed until time reaches the value of the parameter "tOpen".) After entering the circuit, then go to the "Analysis Setup" - "Transient" menu. There set "Print Step" to 1ms and "Final Time" to 6.0s.



1. Place current markers at the non-reference nodes of R1 and of R2, respectively. Run the simulation. Print out the curve. Explain what happens to $I(R1)$ and $I(R2)$ in the time periods of 0 to 1.0 second, 1.0 to 4.0 seconds, and after 4.0 seconds, respectively.
2. Remove the current markers. Place a voltage marker at node A. Run the simulation. Print out the curve. Explain what happens to $V(A)$ in the time periods of 0 to 1.0 second, 1.0 to 4.0 seconds, and after 4.0 seconds, respectively.
3. Draw the equivalent circuit of the time period 1.0 to 4.0 seconds. Calculate the time constant in this time period. Then read the curve carefully and determine the time constant from the curve. Do these values agree? Explain.
4. Draw the equivalent circuit of the time period after 4.0 seconds. Calculate the time constant for time greater than 4.0 seconds. Then read the curve carefully and determine the time constant from the curve. Do these values agree? Explain.

Your report should include the schematics and all curves, as well as all calculations, detailed analysis, and explanations. Your report is due at the beginning of the next recitation session.