ECE-205 : Dynamical Systems

Homework #3

Due : Tuesday September 20 at the beginning of class

Exam 1, Thursday September 22

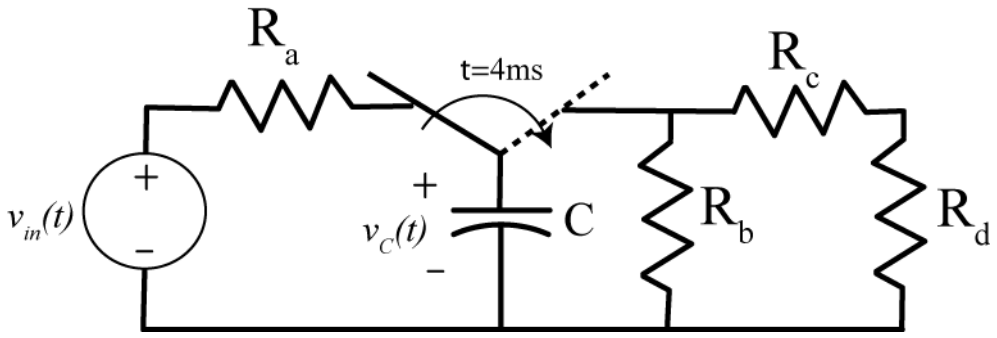
1) Problem 3.3 from the Notes

2) Problem 3.4 from the Notes

3) Problem 3.5 from the Notes

4) Problem 3.6 from the Notes

5) Consider the circuit shown in the figure below:



For both parts of this problem the circuit is initially at rest (no charge on the capacitor) and the switch is connected to the left part of the circuit for t < 4 ms, and is connected to the right part of the circuit for t > 4ms. For both parts of this problem, you are to *sketch* the voltage across the capacitor from 0 to 12 ms. You need to primarily determine the appropriate time constants and steady state values, and use the following table as a guide.

Time (t)	t/τ	$y(t)$
0	0	$0\ y_{ss}$
τ	1	$0.632\ y_{ss}$
2τ	2	$0.865\ y_{ss}$
3τ	3	$0.950\ y_{ss}$
4τ	4	$0.982\ y_{ss}$
5τ	5	$0.993\ y_{ss}$

a) For $R_a = 2k\Omega, R_b = 2k\Omega, R_c = 1k\Omega, R_d = 1k\Omega, C = 2\mu F, V_{in} = 6V$ sketch the voltage across the capacitor.

b) For $R_a = 1k\Omega, R_b = 4k\Omega, R_c = 1k\Omega, R_d = 1k\Omega, C = 1\mu F, V_{in} = 6V$ sketch the voltage across the capacitor.