ECE 2202 – CIRCUIT ANALYSIS II

HOMEWORK #5

1) For the circuit shown below, switches SW1 and SW2 have been in position a for a long time. At *t* = 0, both switches are moved instantaneously and simultaneously to position b and remain there.

1. Find the power delivered by the *vS2* voltage source, as a function of time, for *t* > 0.
2. Calculate the numerical value of the total energy stored in the capacitors at *t* = 



2) For the circuit shown below, Switch A had been closed for a long time, and Switch B had been open for a long time, before *t* = 0. At *t* = 0, Switch A opened. Then, 100[ms] later, Switch B closed. Find *iX*(200[ms]).



3) For the circuit shown below, the Switch A was open for a long time, and Switch B was closed for a long time, before *t* = 0. At *t* = 0, Switch A was closed. Then, 10[s] later, Switch B was opened. Find *vR*(11[s]).



4) In the circuit shown below, all switches have been closed for a long time. Then, at *t* = 0, all switches open, and remain open.

a) Calculate the total energy stored in the capacitors at *t* = .

b) Calculate the energy stored in capacitor *C1* at *t* = .



5) In the circuit shown below, the switch had been in position a for a long time. At *t* = 0, the switch was moved instantaneously to position b , and stayed there for 0.1[s]. Then, at *t* = 0.1[s], the switch was moved instantaneously back to position a , and remained there.

For the time periods 0 < *t* < 0.1[s] and *t* > 0.1[s], find the numerical expressions for the voltage *vR(t)*, as defined in the circuit.



Numerical Solutions:

1. a) Solution omitted. b) 25[mJ]

2. -2.70[mA]

3. 1.405[V]

4. a) 78.4[mJ] b) Solution omitted.

5. Solution omitted.