ECE 2202 – CIRCUIT ANALYSIS II

HOMEWORK #2

1) The current *iC(t)* through the capacitor in Figure 1 is given by the plot shown in Figure 2. It is given that *vC*(2[ms]) = 6[V]. Find *vC*(8[ms]).



2) In the circuit shown below, the switched closed at *t* = 0. No energy was stored in the capacitor, and no energy was stored in the inductor, at *t* = 0. The expression for *vS(t)* is given below.

Find the power delivered by the voltage source at *t* = 5[s].





3) In the circuit shown below, the two switches were open for a long time before *t* = 0, until all voltages and currents stopped changing. Then, both switches closed at *t* = 0. Then, switch SWA opened again 2[s] later.

a) Find *iQ*(0-).

b) Find *iX*(0-).

c) Find *iQ*(0+).

d) Find *iX*(0+).



4) In the circuit shown below, switches SW1 and SW2 have been closed for a long time before   
*t* = 0, allowing all voltages and currents to stop changing.

At *t* = 0, switch SW1 opens and remains open.

At *t* = 0.5[s], switch SW2 opens and remains open.

a) Find *iL*(0-).

b) Find *iX*(0-).

c) Find *iL*(0+).

d) Find *iX*(0+).

e) Find the energy stored in the inductor just before *t* = 0, *wSTO.BY.L*(0-).

f) Find the energy stored in the inductor just after *t* = 0, *wSTO.BY.L*(0+).



5) In the circuit shown below, the energy stored in inductor *L1* was zero when switch SWA closed and switch SWB opened at *t* = 0. Then, 10[ms] later switch SWA opened.

a) Find *vQ*(0-).

b) Find *vQ*(0+).

c) Find the energy stored in the inductor just before *t* = 0, *wSTO.BY.L1*(0-).

d) Find the energy stored in the inductor just after *t* = 0, *wSTO.BY.L1*(0+).



Numerical Solutions:

1. 61.6[V]

2. 86.55[W]

3. a) 0, b) -1.489[mA], c) -3.182[mA], d) -2.55[mA]

4. a) -29[A], b) 30[A], c) -29[A], d) 29[A], e) 84.1[J], f) 84.1[J]

5. a) 0, b) 186.2[mV], c) 0, d) 0