

GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering

ECE 2040
Circuit Analysis

Quiz #3

Friday, March 23, 2001

Name: _____

GENERAL INSTRUCTIONS

1. This is a *closed book, closed notes* exam. You may use one 8.5in \times 11.0in handwritten sheet of notes. You may also use a calculator, if you choose.
2. Please do all of your work on the exam itself. You may use the backs of the pages, if necessary.
3. Please be as neat and well organized as possible.
4. Clearly indicate your answers.

<i>Problem</i>	<i>Max</i>	<i>Score</i>
1	25	
2	25	
3	25	
4	25	
Total	100	

Problem Q3.1: Determine $v_{out}(t)$ as a function of $v_1(t)$ and $v_2(t)$ for the network in Figure 1.

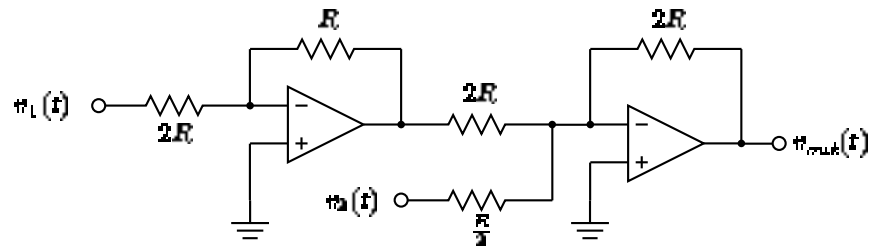


Figure 1: Circuit for Problem Q3.1.

Problem Q3.2: A signal of the form

$$x(t) = (A + Be^{-t} \sin 2t + Ce^{-t} \cos 2t) u(t)$$

has the Laplace transform

$$X(s) = \frac{4s^2 + 11s + 15}{s^2 + 2s^2 + 5s}.$$

Determine the values of A , B , and C .

Problem Q3.3: Find $i(t)$ for $t > 0$ in the circuit in Figure 2.

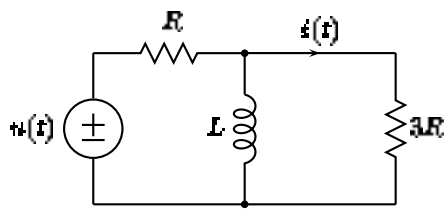


Figure 2: Circuit for Problem Q3.3.

Problem Q3.4: In the circuit in Figure 3 the initial voltages on the two capacitors are known to be $v_1(0) = 0$, $v_2(0) = 1$.

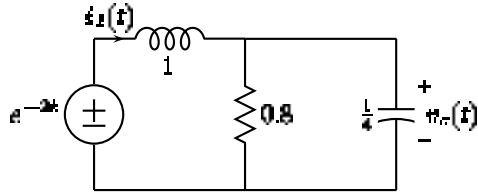


Figure 3: Circuit for Problem Q3.4.

- Draw the Laplace-domain circuit model.
- Determine $V_2(s)$.
- Determine $v_2(t)$, $t > 0$.