GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering

ECE 2040
Circuit Analysis

Quiz #2

Friday, October 6, 2000

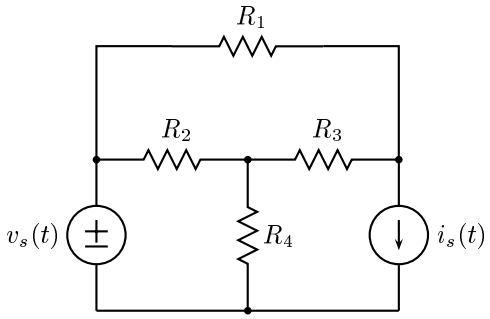
Name: _____

GENERAL INSTRUCTIONS

1. This is a *closed book, closed notes* exam. You may use a calculator is 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.

Problem	*Max*	*Score*
1	25	
2	25	
3	25	
4	25	
Total	100	

Problem Q2.1:

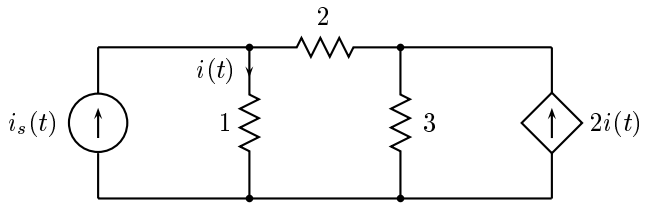


(a) For the circuit above, what is the minimum number of KCL equations that need to be written to specify the equilibrium solution?

(b) Select one of the nodes of the basic network as the ground node and label it. Define node potentials at the remaining nodes of the basic network and write a KCL equation at each of these nodes in terms of the node potentials (and the source waveforms).

(c) Put your equations in matrix-vector form with the node potentials as unknowns. You do not need to solve the equations.

Problem Q2.2:

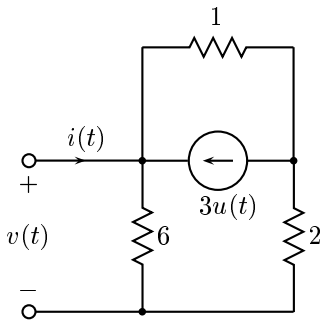


(a) For the circuit above, what is the minimum number of KVL equations that need to be written to specify the equilibrium solution?

(b) Define a mesh current for each mesh of the basic network. Write a sufficient set of KVL equations in terms of the mesh currents and the source waveforms.

(c) Solve your equations and use the results to determine $i(t)$.

Problem Q2.3:

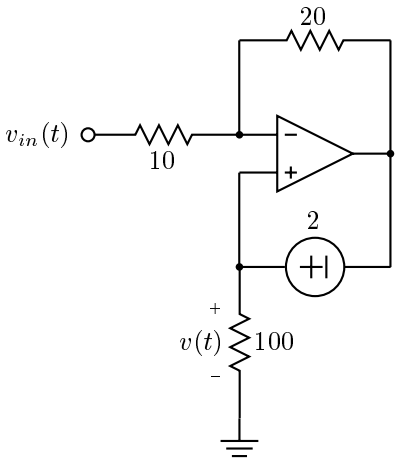


(a) For the above two-terminal network, determine the open-circuit voltage $v_{oc}(t)$.

(b) Determine the short-circuit current, $i_{sc}(t)$.

(c) Determine and sketch the Norton equivalent network.

Problem Q2.4:



(a) Circle the nodes at which you can write valid KCL equations.

(b) Label the potential of each node in the circuit.

(c) Solve for $v(t)$.