ECE 209 — Final Exam

Estimated time for completion: <2 hours
16 December 2014

Rules of the Exam

Rule 1: The examination period begins at 12:15am on Tuesday 16 December 2014 and ends at 2:15pm on Tuesday 16 December 2014.

Rule 2: There are four problems, each problem has equal weight.

Rule 3: The exam is closed book and closed notes. You may have an 8.5" x 11" sheet of paper with notes and a calculator.

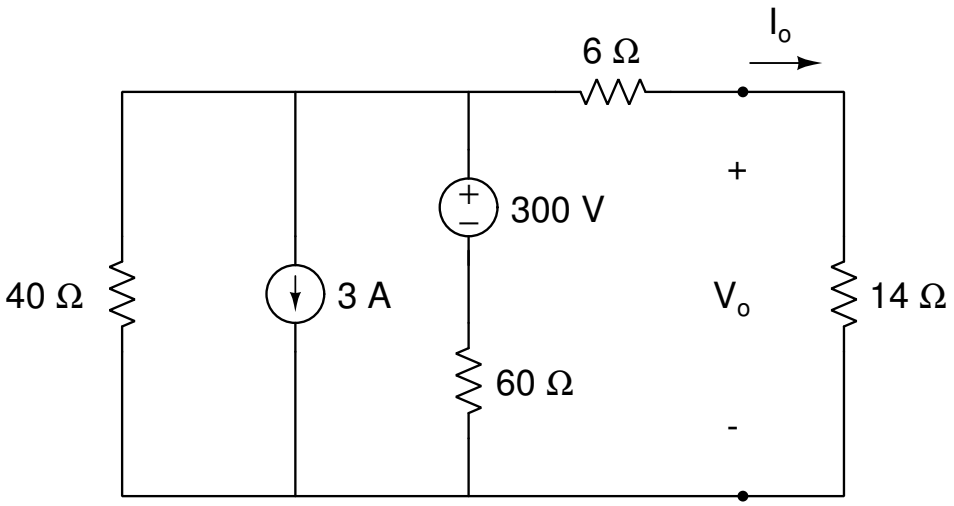
Rule 4: Show all work and state all assumptions.

_____

Name

Problem 1

Determine the values of V_o and I_o in the circuit below:

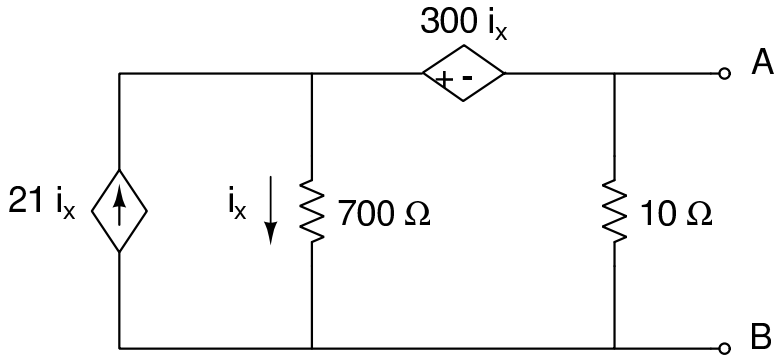


V_o = _____

I_o = _____

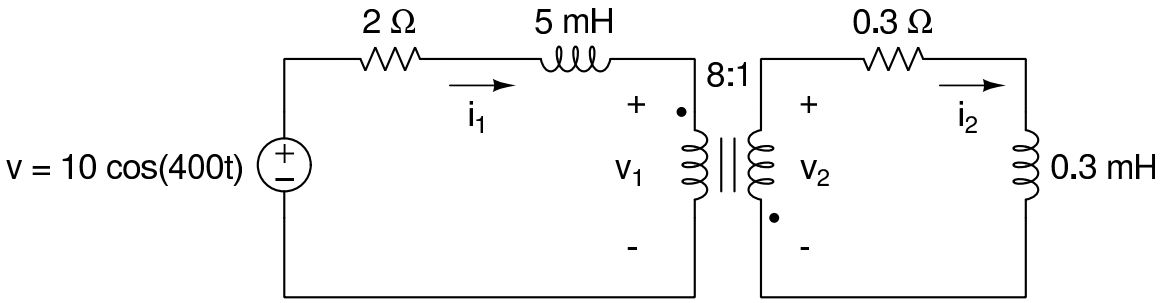
Problem 2

Determine the Thévenin equivalent circuit with respect to terminals A and B in the circuit below.



Problem 3

Find the steady-state expressions for $i_1(t)$, $i_2(t)$, $v_1(t)$, and $v_2(t)$ in the circuit below. Assume the transformer is ideal.



$i_1(t) =$ _____

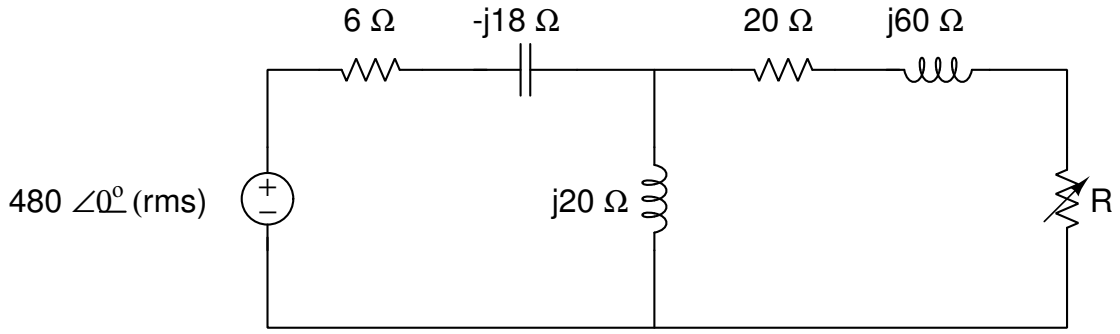
$i_2(t) =$ _____

$v_1(t) =$ _____

$v_2(t) =$ _____

Problem 4

The variable resistor R in the circuit below is adjusted until the average power it dissipates is a maximum.



Part A: What is R? _____

Part B: What is the maximum average power dissipated by R? _____