ECE 209 — Exam # 2

Estimated time for completion: <75 minutes
29 October 2015

Rules of the Exam

Rule 1: The examination period begins at 11:00am on Thursday 29 October 2015 and ends at 12:15pm on Thursday 29 October 2015.

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

Rule 3: Show all work and state all assumptions. Make sure to include the units along with the numerical answer.

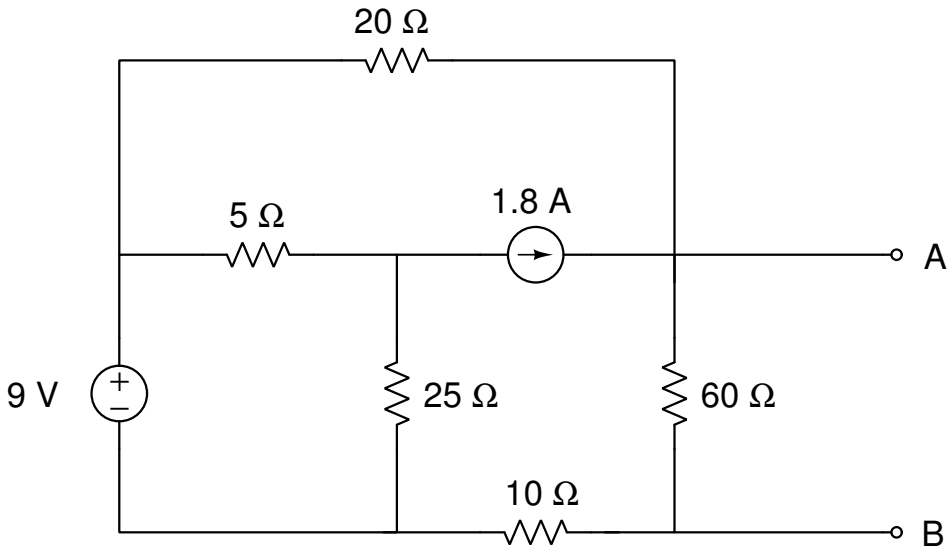
Rule 4: The exam is closed book and closed notes. You may have an 8.5" x 11" sheet of paper with notes. You may use a calculator.

_____

Name

Problem 1 (25 points)

Consider the circuit below:



Part A: Draw the Thévenin Equivalent Circuit with respect to terminals A and B.

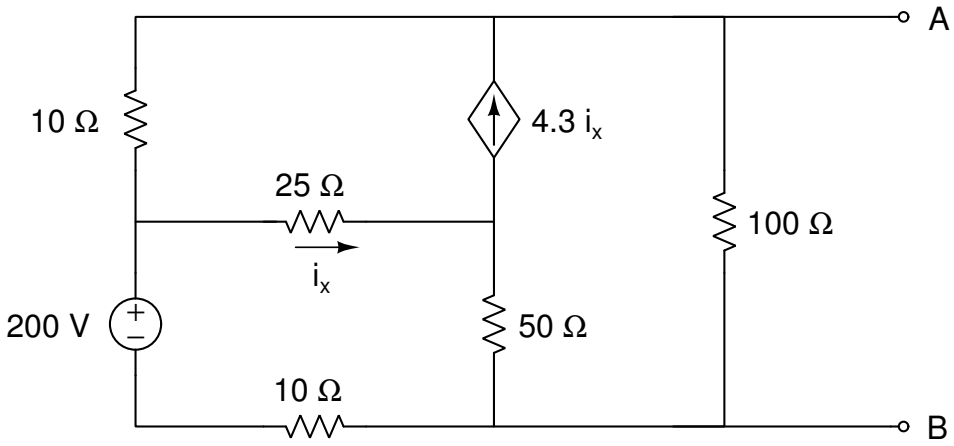
Part B: If a load resistor R_L is placed between terminals A and B:

What value of R_L produces maximum power transfer to the load? _____

What is the maximum power dissipated by R_L? _____

Problem 1 (25 points)

Consider the circuit below:

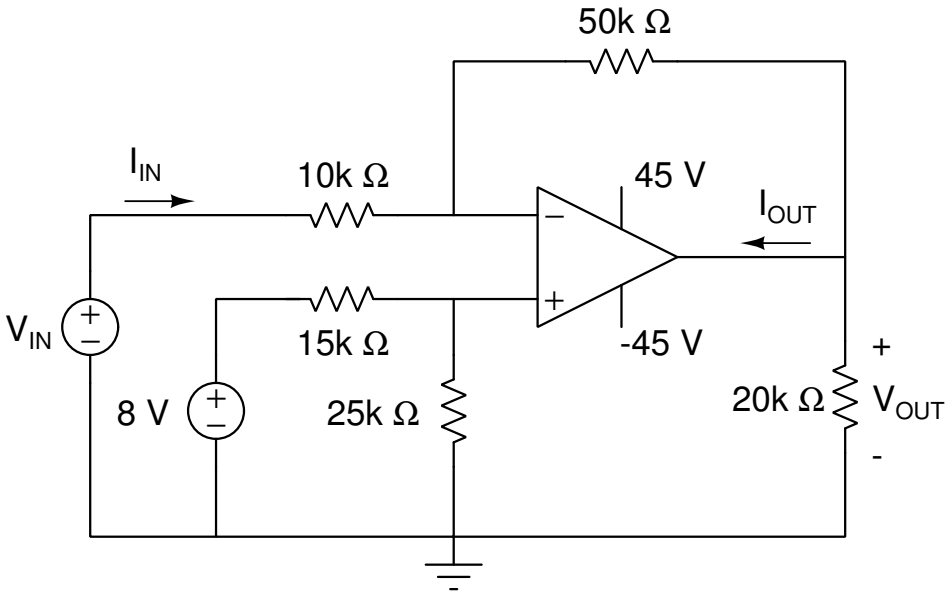


Part A: Draw the Thévenin Equivalent Circuit with respect to terminals A and B.

Part B: Draw the Norton Equivalent Circuit with respect to terminals A and B.

Problem 3 (25 points)

Consider the ideal Op Amp circuit below:



Derive an expression relating V_{OUT} as a function of V_{In}: _____

When $V_{\mathrm{IN}} = 4$ V, what is the current I_{IN}? _____

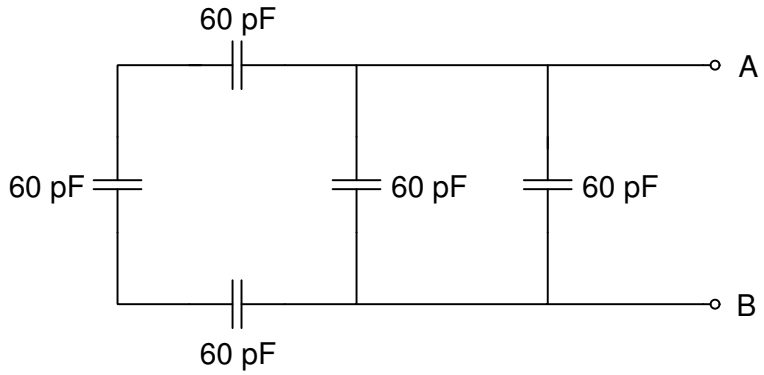
When $V_{\mathrm{IN}} = 4$ V, what is the current I_{OUT}? _____

Complete the table below:

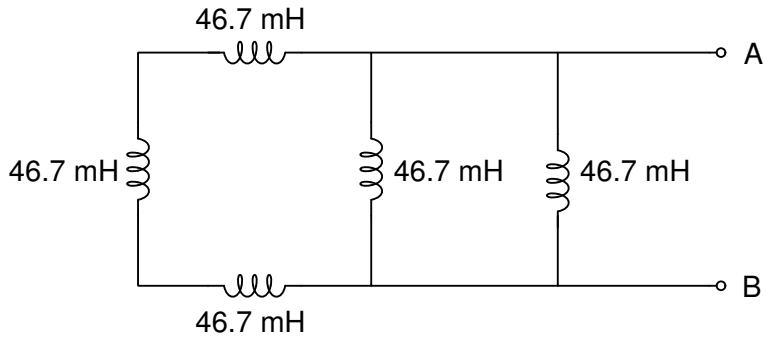
V_{In}	V_{Out}
-4 V	
-2 V	
0 V	
2 V	
4 V	

Problem 4 (25 points)

Consider the circuits below:



What is the equivalent capacitance between terminals A and B? _____



What is the equivalent inductance between terminals A and B? _____

Name: _____

Name: _____

Name: _____