

ECE 209 — Exam # 2

Estimated time for completion: <75 minutes
27 October 2016

Rules of the Exam

Rule 1: The examination period begins at 11:00am on Thursday 27 October 2016 and ends at 12:15pm on Thursday 27 October 2016.

Rule 2: There are four problems.

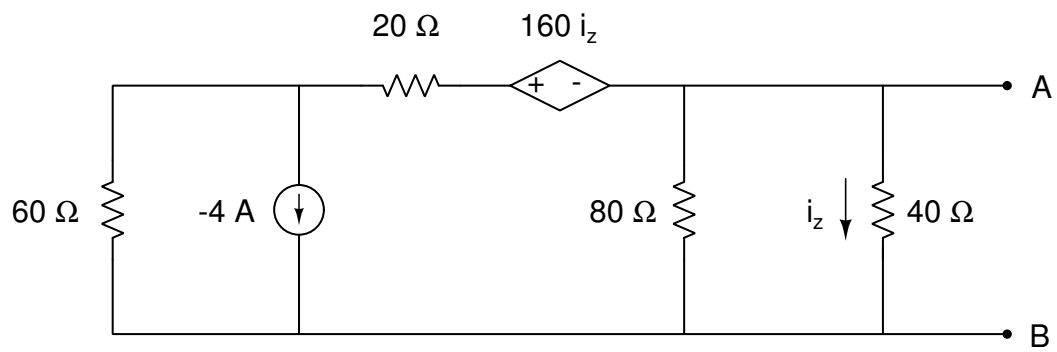
Rule 3: Show all work and state all assumptions. Make sure to include the units along with the numerical answer.

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 (20 points)

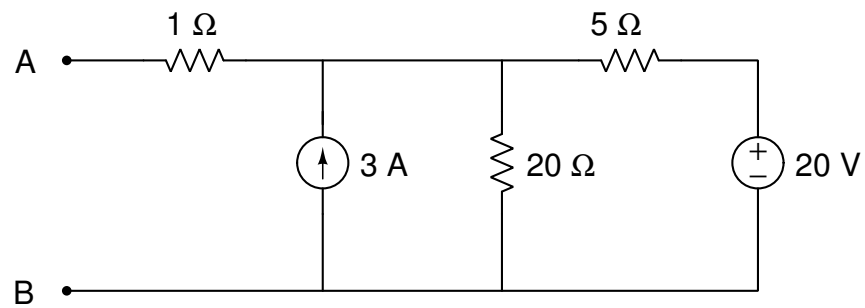
Consider the circuit below:



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

Problem 2 (30 points)

Consider the circuit below:



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

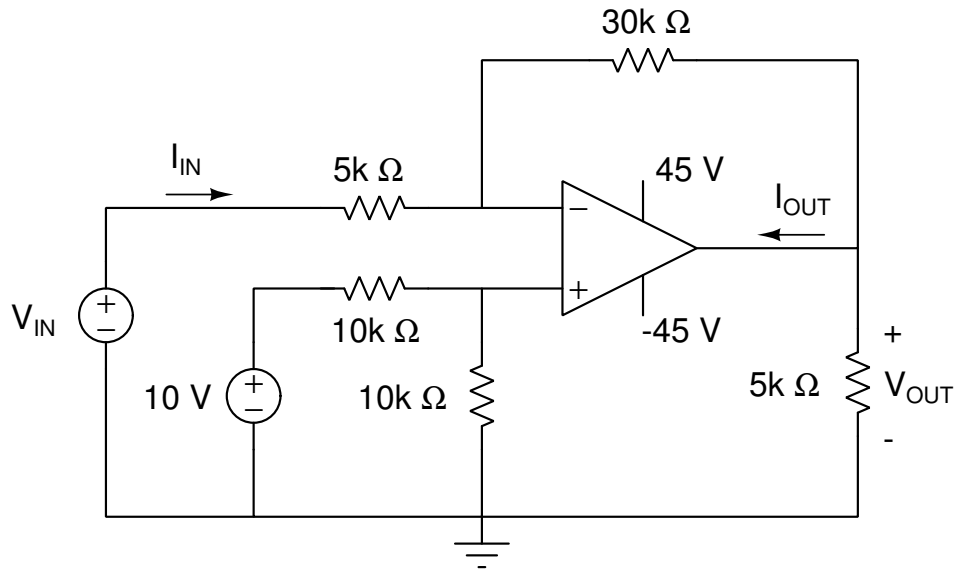
Part B: If a load resistor R_L is placed between terminals A and B:

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

What is the maximum power dissipated by R_L ? _____

Problem 3 (20 points)

Consider the ideal Op Amp circuit below:



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

When $V_{IN} = 5\text{ V}$, what is the current I_{IN} ? _____

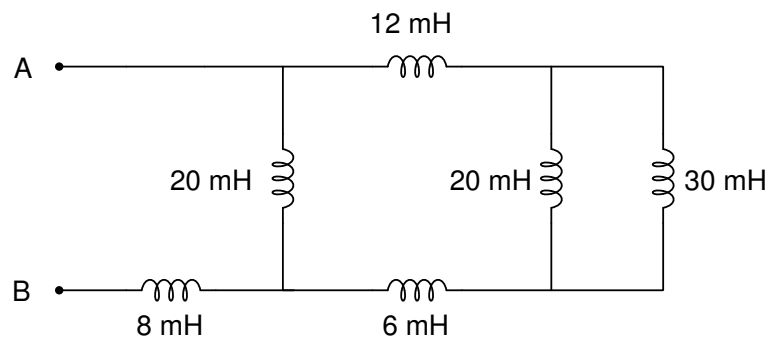
When $V_{IN} = 5\text{ V}$, what is the current I_{OUT} ? _____

Complete the table below:

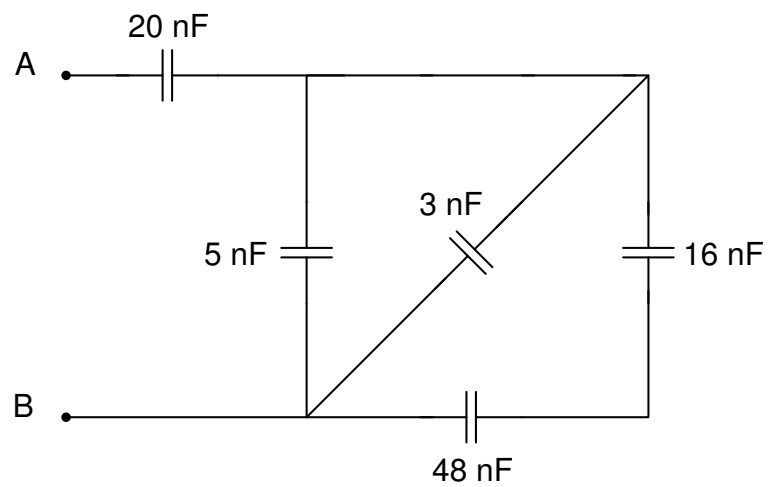
V_{In}	V_{Out}
-4 V	
-2 V	
0 V	
2 V	
4 V	

Problem 4 (30 points)

Consider the circuits below:



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



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

Name: _____

Name: _____