ECE 209 — Exam # 4

Estimated time for completion: <50 minutes
22 April 2015

Rules of the Exam

Rule 1: The examination period begins at 1:10pm on Wednesday 22 April 2015 and ends at 2:00pm on Wednesday 22 April 2015.

Rule 2: There are three problems and one extra-credit problem.

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

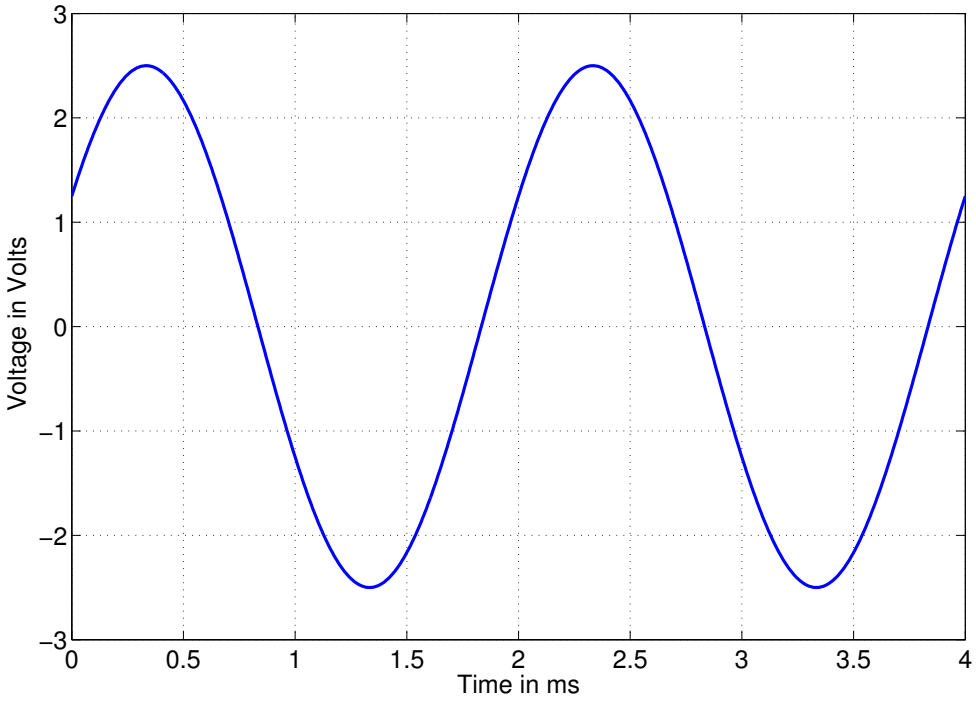
Rule 5: Please put your name on each page of the exam.

_____

Name

Name: _____

Problem 1 (50 points)



Consider the voltage waveform shown above:

What is the amplitude of the voltage? _____

What is the period? _____

What is V_{RMS}? _____

What is the equation for $v(t)$? _____

What is the Phasor representation of the following time-domain signals:

$v(t) = 15\cos(2000t + 20°)$ mV _____

$i(t) = 25\sin(3500t + 65°)$ A _____

If the frequency is 25 kHz, what is the time-domain representation of the following Phasor signals:

$\mathbf{V} = 12 \angle -40°$ V _____

$\mathbf{I} = 2 \angle 65°$ A _____

Perform the following operations:

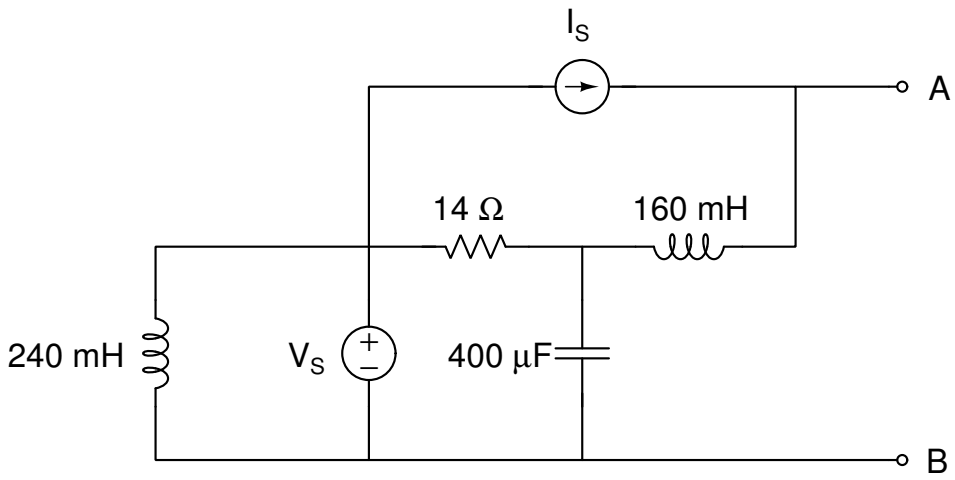
$2\angle 45^\circ + 5 - 3j =$ _____

$4\angle 40^\circ \times 2\angle 40^\circ =$ _____

Name: _____

Problem 2 (30 points)

In the circuit below $V_s(t) = 50\cos(100t)$ V and $I_s(t) = 2\sqrt{2}\cos(100t + 45°)$ A



Part A: Draw the frequency-domain representation of the circuit.

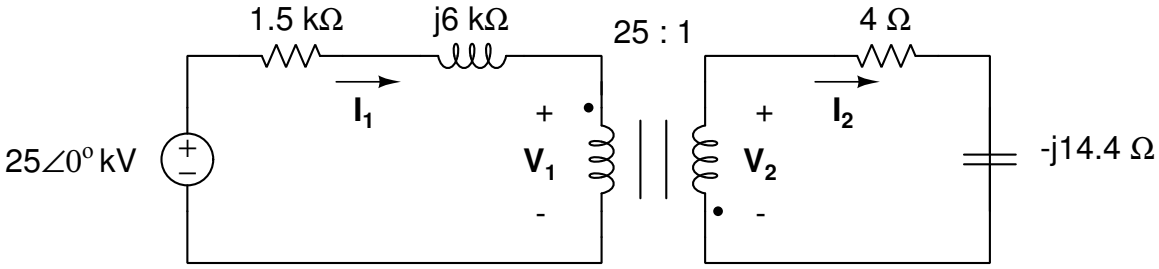
Name: _____

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

Name: _____

Problem 3 (20 points)

Consider the circuit below:



What is the Amplitude and Phase Angle of $\mathbf{V}_2$? _____

What is the Amplitude and Phase Angle of $\mathbf{I}_2$? _____