Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (please print)

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ECE 2202 – Quiz #5

November 27, 2018

Keep this quiz closed and face up until you are told to begin.

1. This quiz is closed book, closed notes. You may use one 8.5” x 11” crib sheet, or its equivalent.

2. Show all work on these pages. Show all work necessary to complete the problem. A solution without the appropriate work shown will receive no credit. A solution which is not given in a reasonable order will lose credit.

3. It is assumed that your work will begin on the same page as the problem statement. If you choose to begin your work on another page, you must indicate this on the page with the problem statement, with a clear indication of where the work can be found. **If your work continues on to another page, indicate clearly where your work can be found. Failure to indicate this clearly will result in a loss of credit.**

4. Show all units in solutions, intermediate results, and figures. Units in the quiz will be included between square brackets.

5. Do not use red ink. Do not use red pencil.

6. You will have 30 minutes to work on this quiz.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/20

Room for extra work

A load is connected to a voltage source. The voltage source has a frequency of 60[Hz], and an rms value of 120[Vrms]. The voltage source is a cosine function with a phase of 38. The load is a resistance of 7.3[] in parallel with an inductance of 14.2[mH]. The line connecting the load and the source is negligible, that is, it has an impedance that is effectively zero.

1. Find the impedance of the load.
2. Find the real power absorbed by the load.
3. Find the reactive power delivered by the load.
4. Find the complex power absorbed by the load.
5. Find the apparent power absorbed by the load.
6. Find the power factor for the load.

Room for extra work

Solution:

A load is connected to a voltage source. The voltage source has a frequency of 60[Hz], and an rms value of 120[Vrms]. The voltage source is a cosine function with a phase of 38. The load is a resistance of 7.3[] in parallel with an inductance of 14.2[mH]. The line connecting the load and the source is negligible, that is, it has an impedance that is effectively zero.

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5. Find the apparent power absorbed by the load.
6. Find the power factor for the load.
7. We begin by finding the angular frequency



1. To find the complex power absorbed by the load, we use



From this, we get that the real power, *Pabs.by.load*= 1973[W].

 we get that the real power, *Pabs.by.load*= 1973[W].

1. Similarly, we get that the reactive power, *Qdel.by.load*= -2682[VAR].
2. The complex power was previously determined to be



1. The apparent power absorbed by the load is



1. The power factor for the load is
2. 

It is lagging because the angle is positive.