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

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

ECE 2300 – Quiz #1

September 22, 2015

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

Find the power delivered by the 5[V] voltage source.



Room for extra work

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

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

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September 22, 2015

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Room for extra work

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

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

Room for extra work

Find the power delivered by the 5[V] voltage source.



Room for extra work

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

ECE 2300 – Quiz #1

September 22, 2015

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

Room for extra work

Find the power delivered by the 5[V] voltage source.



Room for extra work

ECE 2300 -- Quiz #1 – September 22, 2015 – Solution Version 1. Only the solution for this version is shown. We will assume that you can determine the solution for other versions from this.

Find the power delivered by the 5[V] voltage source.



To begin this solution, we look at the circuit, and define additional variables that we think that we may need. We choose at this point to define the current through the 10[] resistor, since we suspect that we may need it. Remember that you can define other variables if you wish; this does not take much time, and may be useful. In this same diagram, we name the closed loops and closed surfaces that we will be using.



Now, we can write some equations for the variables we want. Remember in particular that we want the current *iX* so that we can find the power associated with the 5[V] voltage source. So, we begin with KVL for Closed Loop #1, which includes *iX*. We have,



Clearly, we need *iQ*, so we write KCL for Closed Surface #1, to get



So, now we need an equation for *vX*. Let’s write KVL for Closed Loop #2, to get



This is three equations in three unknowns, and we can solve. We get

*iX* = 7.259[A], *vX* = 1.777[V], and *iQ* = 3.404[A].

Using this result, we can write





Another version of the quiz has an 11[] resistor, which means that

*iX* = 7.240[A].

Using this result, we can write





Another version of the quiz has a 12[] resistor, which means that

*iX* = 7.225[A].

Using this result, we can write





Another version of the quiz has a 13[] resistor, which means that

*iX* = 7.212[A].

Using this result, we can write



