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

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

ECE 2202 – Final Exam

December 7, 2021

Keep this exam closed until you are told to begin.

1. This exam is closed book, closed notes. You may use one 8.5” x 11” crib sheet, or its equivalent. You may use a calculator. You should **not** use a cell phone, tablet computer, or laptop computer, as you work on this exam.

2. Show all work on these pages. You may use both sides of each page. You may separate the pages as you work. Show all work necessary to complete the problem. A solution without the appropriate work shown will receive no credit. A solution that is not given in a reasonable order will lose credit. Clearly indicate your answer (for example by enclosing it in a box).

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.

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

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

6. You will have 170 minutes to work on this exam.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/40

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/40

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/40

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/40

5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/40

Total = 200

Room for extra work

1. {40 Points} Find the Thevenin equivalent resistance as seen by the 15[V] voltage source.



# Room for extra work

2. {40 Points} In the circuit shown below, the switch SWA had been closed, and switch SWB had been open, for a long time before *t* = 0. Then, switch SWA opened at *t* = 0. Then, the switch SWB closed 1.2[s] after that. Find *iA*(2.5[s]).



Room for extra work

3. {40 Points} The circuit shown operates in steady state. Find the numerical expression for *vB(t)*.





Room for extra work

4. {40 Points} The circuit shown operates in steady state.





1. Find the equivalent impedance seen by the current source.
2. Find the equivalent resistance seen by the current source.
3. Find the equivalent reactance seen by the current source.
4. Find the equivalent susceptance seen by the current source.
5. Find the reactive power absorbed by the current source.
6. Find the period of *iA(t)*.

Room for extra work

5. {40 Points} The circuit shown operates in steady state.





It is known that Load 1 absorbs 9.5[kW] and delivers 6.8[kVAR].

It is known that Load 2 absorbs [kVA].

It is known that Load 3 absorbs 8.7[kW] at a leading power factor of 0.82.

It is known that Load 4 absorbs 5.4[kVA] at a lagging power factor of 0.75.

1. Find the value of the current source *iA(t)*.
2. Find the value of *iB(t)*.
3. Another student claims that *vB(t)* is equal to exactly half of *vA(t)*. You are asked to determine whether this claim is true, whether the claim is false, or whether the claim cannot be determined to be true or false. What is your answer? Defend your answer, either with mathematical equations, or with clear sentences that explain how you determined your answer, or with a combination of equations and sentences.

Room for extra work































