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

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

ECE 2202 – Final Exam

July 6, 2023

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

1. This exam is closed book, closed notes. You may use any calculator. You may **not** use a cell phone, tablet computer, nor laptop computer. You may have a crib sheet in the form of one 8 ½” x 11” piece of paper, with material written on both sides.
2. Print your name, and provide your signature above.
3. 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. You may separate the pages as you work.
4. Show all units in solutions, intermediate results, and figures. Units in the exam will be included between square brackets.
5. If the grader has difficulty following your work because it is messy or disorganized, you will lose credit.
6. Do not use red ink. Do not use red pencil.
7. You will have 165 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) Use the circuit below to solve. The power absorbed by *RX* is the largest possible, when *RX* is 5.6[k]. Find the value of *X* that makes this statement valid. Include any appropriate units in your solution.



Room for extra work

2. (40 points) The switch was in position a for a long time before it moved to position b at *t* = 0. Then, at *t* = 2.3[s], it moved to position c. Find *iA*(5[s]).



Room for extra work

3. (40 points) It was determined that there was no energy stored in either inductor at *t* = 0. Then, at t = 1[s], the switch moved from a to b.

a) Find *vA*(3[s]).

b) Find the energy stored in *LA* at *t* = 2[s].



Room for extra work

4. (40 points) The circuit shown operates in steady-state.

a) Redraw the circuit in the phasor domain.

b) Find the numerical expression for *iB(t)*.





Room for extra work

5. (40 points) The circuit shown operates in steady-state. It is given that



It is also given that Load 3 can be modeled by a resistor with a value of 27[W] in series with a capacitor with a value of 150[mF].

a) Find *vB(t)*.

b) Find the voltage across the current source.

c) Find the power factor angle for the combination of the three loads, taken as a single load.































