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

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

ECE 2201 – Final Exam

August 9, 2024

Do not open this quiz until you are told to begin.

1. Print your name, and sign your name, at the top of this page.
2. 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 quiz.
3. Show all work on these pages, and you may use both sides of each page. 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. Do not use red ink. Do not use red pencil.
6. You will have 100 minutes to work on this exam.
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/30
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/30
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/30
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/10

Room for extra work

1. {30 Points} Use the circuit shown below to solve. The charge carriers are electrons. For Device 1, the ratio of *vB* to *iC* is equal to 75[V/A], for any circuit in which it is connected.
2. Find a numerical expression for the power absorbed by Device 1.
3. Find *vA.*
4. Find the power delivered by the 27[V] voltage source.
5. Are the charge carriers moving through the 27[V] voltage source gaining or losing energy as they move through that source? Explain your answer using complete sentences.



Room for extra work

1. {30 Points} Use the node-voltage method to write a complete set of equations that could be used to solve this circuit. Do not simplify the circuit. Do not attempt to solve or simplify your equations. Define all variables appropriately.



Room for extra work

1. {30 Points} Use the circuit shown below to solve.
2. Find the Norton equivalent as seen by the 3.7[mA] current source. Draw the equivalent circuit, labeling the components with numerical values. Attach the 3.7[mA] current source to your equivalent circuit.
3. Find the power delivered by the 3.7[mA] current source.



Room for extra work

4.{10 Points} Use the circuit shown below to solve.

a) Find the equivalent resistance with respect to terminals B and C.

b) Find the equivalent resistance with respect to terminals C and D.



















