**Experiment 12**: Constrained Design – Nodal Voltages

(Edit this document as needed)

Partner 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Design Challenge 1*

Schematic

DC operating point simulation results

Measured results

Comments on the difference between measured results and simulation/calculation results

*Design Challenge 2*

Schematic

DC operating point simulation results

Measured results

Comments on the difference between measured results and simulation/calculation results

*Design Challenge 3*

Schematic

Linear system of equations after applying KCL at the ‘unknown’ nodes. (The unknown nodes are the nodes you identify when applying nodal analysis to the above schematic.)

Matrix expression

Application of matrix mathematics to verify that the nodal voltages are consistent with the design voltages

DC operating point simulation results

Measured results

Demonstrate working design challenge 3 experiment (circuit design on Protoboard and measured results on Alice tools) to the instructor/TAs/UGSAs. Details of check-off process listed on next page of this document.

Initials of instructor/TA/UGSA:\_\_\_\_\_\_\_\_\_

Date and time of check-off: \_\_\_\_\_\_\_\_\_

Comments on the difference between measured results and simulation/calculation results

Due: March 3rd, 2022 at 11:59 pm eastern on Gradescope

One student submits on Gradescope and adds their partner using “add group members” option on Gradescope.

**Demonstration of specific task(s) in an Experiment:**

1. To be completed as a group (if you are working in a group of 2 students) or individual (if you work by yourself).
2. During demonstration, you and your partner need to interact with the teaching staff member.
3. You may do this during class or during office hours/helps sessions.
   1. All help sessions and office hour details are here: <https://www.ecse.rpi.edu/courses/S22/ECSE-1010/#staff>

1. The teaching staff member will ask you some questions to make sure you are conducting the experiments the right way and are understanding the related concepts.