

Intro Quiz # 1
ENGN/PHYS 207—Fall 2020

Foreword

The purpose of this little intro quiz is simply to assess where everyone is at in terms of Circuits background. Responses will help the instructor to best support everyone's learning and success in the course. Please do your best, but remember there is absolutely zero pressure. If you find this material difficult/impossible: fear not, you'll be an old pro in 2-3 weeks. If you find this material to be a breeze, good on you and I promise you won't be bored in this class. If you find yourself anywhere in between, all good too!

NAME (optional):

Problems to solve

1. Consider the Circuit show in Figure 1

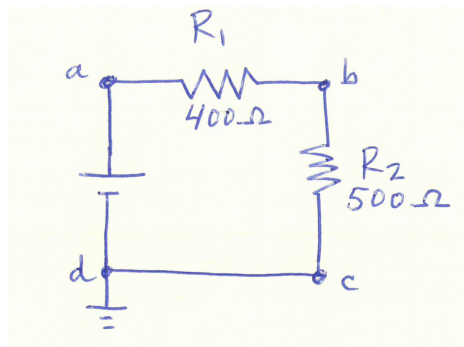


Figure 1: Our first circuit of the year! Assume battery voltage is 9V.

- (a) How much current flows through R_1 ?
- (b) Compute the voltage drop across R_2 .
- (c) What is the voltage at node a with respect to node d?
- (d) How long will the battery last? Assume it is rated for 1000 mA-hr.
- (e) What is the common name given to this omnipresent circuit? (\$2000 Jeopardy Question!)

2. Consider the resistor network shown in Figure 2.

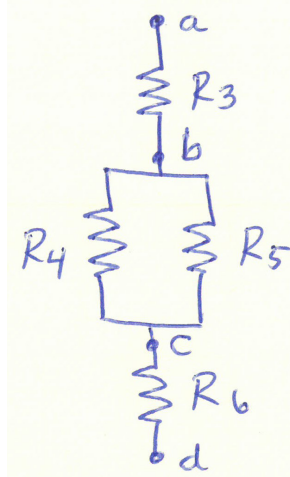


Figure 2: All resistors $100\ \Omega$.

- (a) Compute the equivalent resistance between nodes a and d.
- (b) Imagine adding one more resistor in parallel to R_4 and R_5 . Would the equivalent resistance increase or decrease. Provide a brief intuitive explanation (no need to calculate anything, but you can if it helps).

3. What is the decimal (base-10) equivalent of the binary number 10001111 ?

4. Match the Circuits parts shown in Figure 3 with the appropriate name/label below. (Write the letter A-H next to the the matching name)



Figure 3: Things commonly found in the Circuits lab.

- | | | | | |
|--------------|---------------|------------------|--------|-----------|
| Diode | Capacitor | Inductor | Ground | Amplifier |
| Power source | Potentiometer | Prof Rabbit Ears | | |