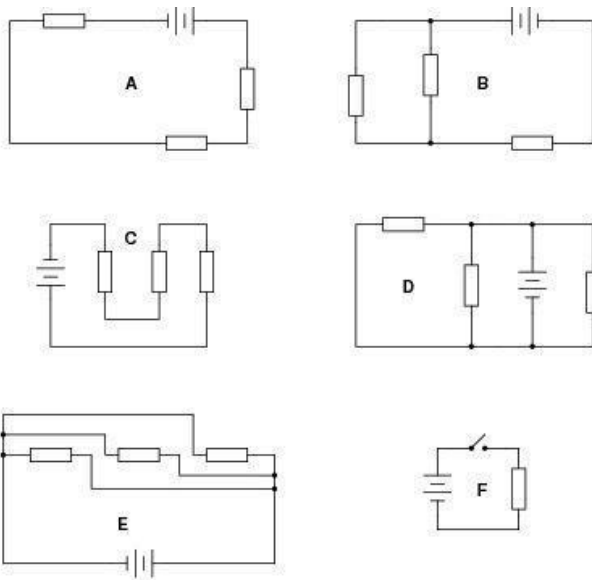


Homework 1: Number Systems, Digital Logic

This assignment is to be submitted electronically via Gradescope. You must upload your answers as a PDF to Gradescope by Friday, 9/27/19 at 11:59pm.

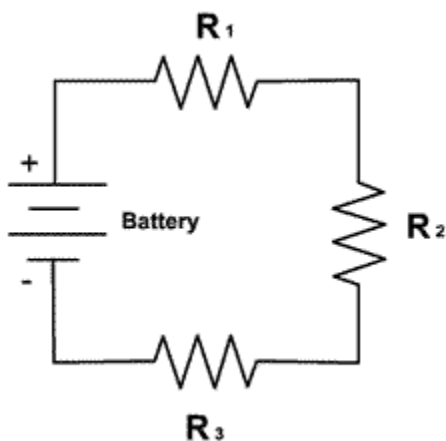
1. Consider the following circuits. The resistors are shown as empty rectangles in the diagrams below. (10 points)

- 1a. Identify which of these circuits contains resistors only in series.
- 1b. Identify which of these circuits contains resistors only in parallel.
- 1c. Identify which of these circuit contain resistors in a combination of both series and parallel.



2. Calculate appropriate values for each of the following series circuits. Show your work.

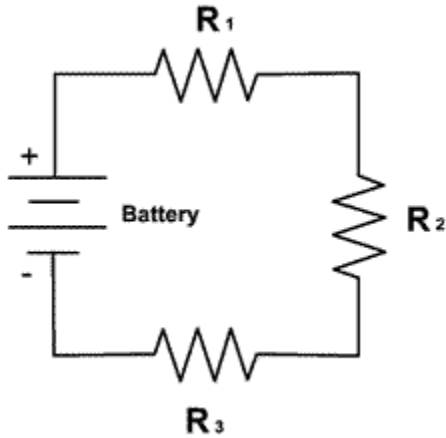
- 2a. Determine the total Resistance for the circuit. (3 points)
- Determine the Current for the entire circuit. (3 points)
- Determine the Voltage Drop across each of the 3 resistors (4 points each)



Assume that for the circuit:

- The battery is 12V
- R1 is 10Ω
- R2 is 20Ω
- R3 is 40Ω

- 2b. Determine the total Resistance for the circuit. (3 points)
 Determine the Current for the entire circuit. (3 points)
 Determine the Voltage Drop across each of the 3 resistors (4 points each)

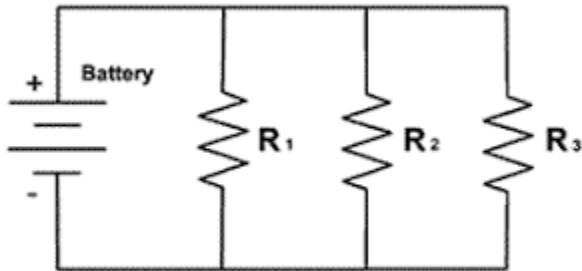


Assume that for the circuit:

- The battery is 5V
- R1 is 1kΩ
- R2 is 2kΩ
- R3 is 3kΩ

3. Calculate appropriate values for each of the following parallel circuits. Show your work.

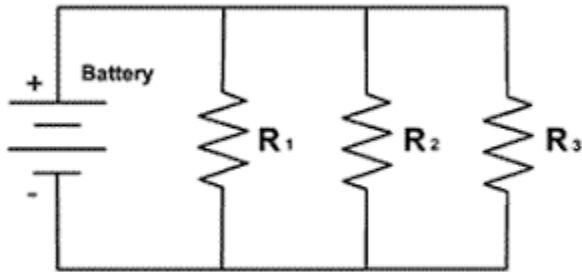
- 3a. Determine the total Resistance for the circuit. (3 points)
 Determine the Current for the entire circuit. (3 points)
 Determine the Current passing through each of the 3 resistors (4 points each)



Assume that for the circuit:

- The battery is 12V
- R1 is 1kΩ
- R2 is 2kΩ
- R3 is 4kΩ

- 3b. Determine the total Resistance for the circuit. (3 points)
 Determine the Current for the entire circuit. (3 points)
 Determine the Current passing through each of the 3 resistors (4 points each)

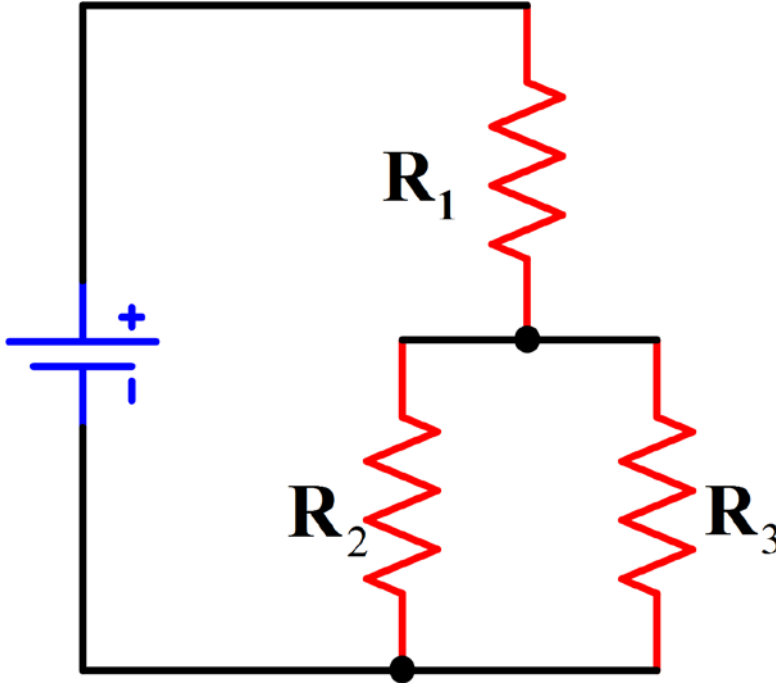


Assume that for the circuit:

- The battery is 5V
- R1 is 5Ω
- R2 is 2Ω
- R3 is 3Ω

4. Calculate appropriate values for each of the following circuits. Show your work.

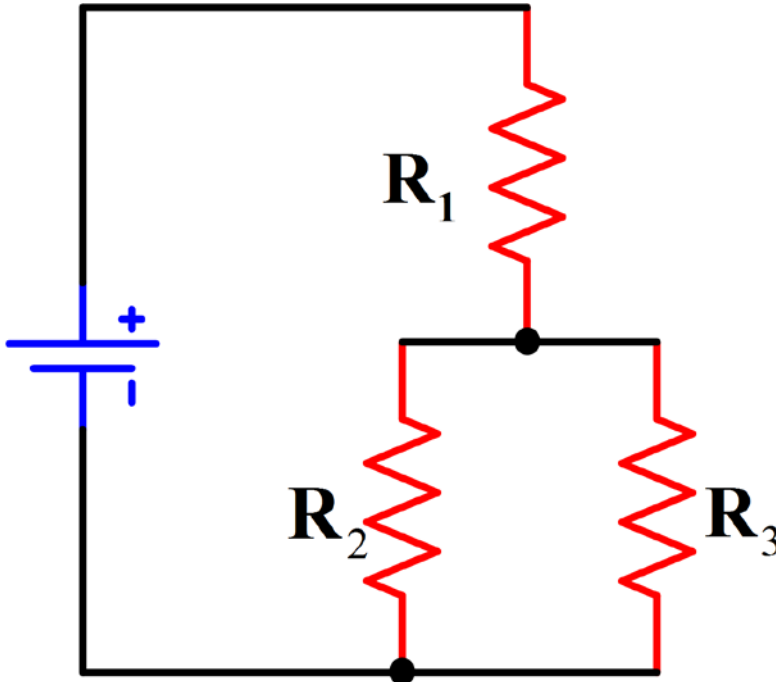
- 4a. Determine the total Resistance for the circuit. (3 points)
 Determine the Current for the entire circuit. (3 points)
 Determine the Current passing through each of the 3 resistors (4 points each)



Assume for the circuit:

- The battery is 12v
 R_1 is $2k\Omega$
 R_2 is $4k\Omega$
 R_3 is $8k\Omega$

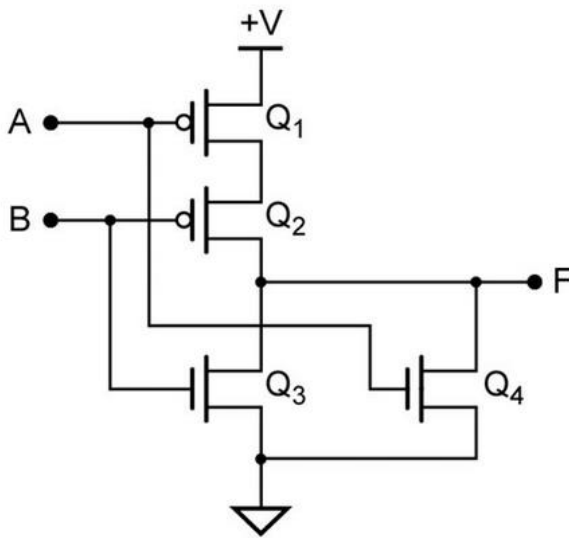
- 4b. Determine the total Resistance for the circuit. (3 points)
 Determine the Current for the entire circuit. (3 points)
 Determine the Current passing through each of the 3 resistors (4 points each)



Assume for the circuit:

- The battery is 5v
 R_1 is 2Ω
 R_2 is 3Ω
 R_3 is 5Ω

5a. Write the truth table for the CMOS Circuit given below and specify which logic gate it represents. (5 points)



5b. Write the truth table for the CMOS Circuit given below and specify which logic gate it represents. (5 points)

