ENGR 3020 Home Assignment 2

100 Points

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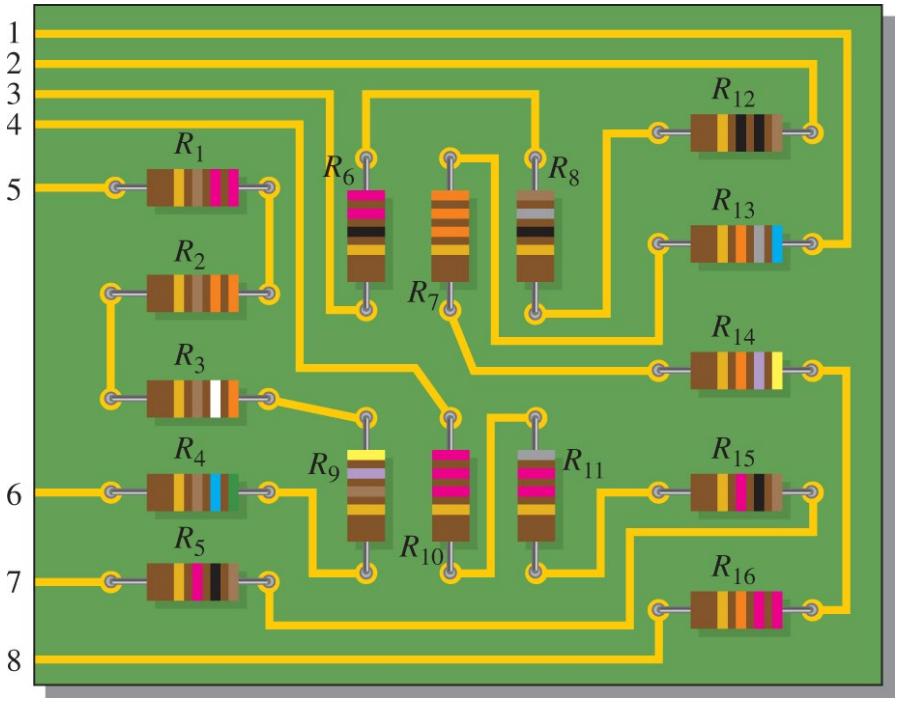
NOTE: SHOW ALL YOUR WORK. WRITING THE ANSWERS WITHOUT SHOWING YOUR WORK WILL RESULT IN NO POINTS.

Chp4.

4. Determine the resistance between pins 2 and 3 in the circuit board in **Figure 4–65**.

Figure 4–65



11. Determine the resistance between each of the following sets of pins on the PC board in **Figure 4–65**.

a. pin 1 and pin 8 a. 4
b. pin 2 and pin 3 b. 3
c. pin 4 and pin 7 c. 4
d. pin 5 and pin 6 d. 5

15. What is the current in each circuit of **Figure 4–70**? Show how to connect an ammeter in each case.

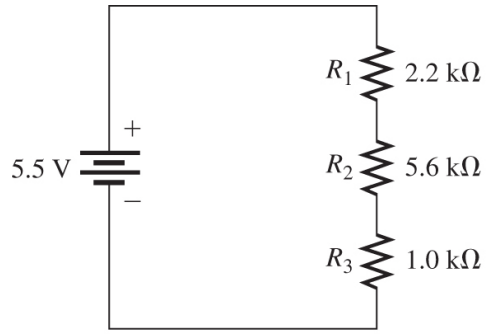
The first circuit diagram shows a 5.5-volt voltage source whose positive and negative terminals are connected across a vertical branch that consists of three resistors R subscript 1, R subscript 2, and R subscript 3 with values as 2.2 kilo ohms, 5.6 kilo ohms, and 1 kilo ohm respectively.

The second circuit diagram shows three branches in series arranged in the form of a right triangle. The vertical branch consists a 16-volt voltage supply whose positive terminal is connected to resistor R subscript 1 with value as 1 mega ohm. The negative terminal is connected to resistor R subscript 3 with value as 560 kilo ohms. The diagonal branch has a resistor R subscript 2 with value as 2.2 mega ohms.

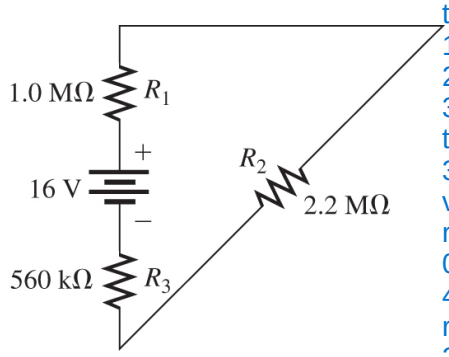
15-16
a. r1 = 2200
r2 = 5600
r3 = 1000
total resistance: 2200 +5600+1000=8800 ohms
total current: 5.5 /88000 = .000625 A
voltage: v1 = .000625 * 2200 = 1.375
v2 = .000625 * 5600 = 3.5
v3 = .000625 * 1000 = .625

Figure 4–70

to connect an ammeter: place the ammeter in series with each resistor to measure the current flowing through each resistor.



(a)



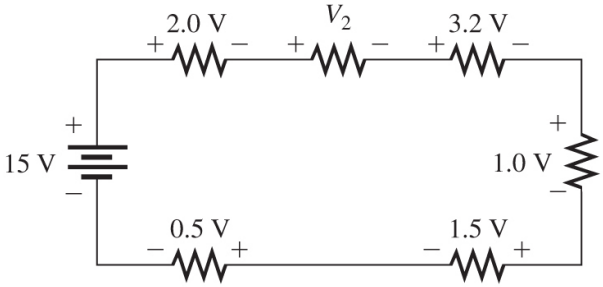
(b)

15-16
b. r1 = 1000000
r2 = 2200000
r3 = 560000
total resistance: 1000000+ 2200000+560000 = 3760000
total current: 16 / 3760000 = .00000426A
voltage:
r1= .0 0000426A * 1000000 = 4,26
r2 = .00000426A * 2200000 = 9.372
r3 = .00000426A * 560000 = 2.3856

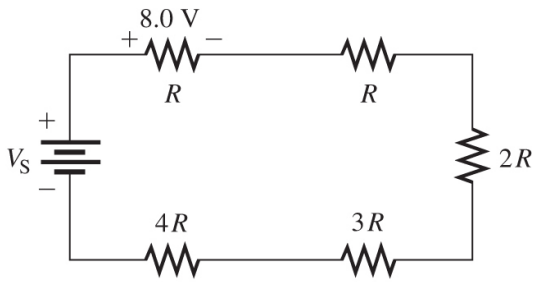
16. Determine the voltage across each resistor in **Figure 4–70**.

23. Determine the unspecified voltage drop(s) in each circuit of **Figure 4–71**. Show how to connect a voltmeter to measure each unknown voltage drop.

Figure 4–71



(a)



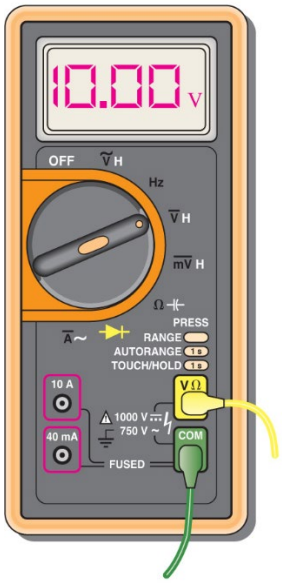
(b)

a. 2.0V + 3.2V + 1V + 1.5V + .5V = 8.2
15 - 8.2 = 6.8V
V2 = 6.8V

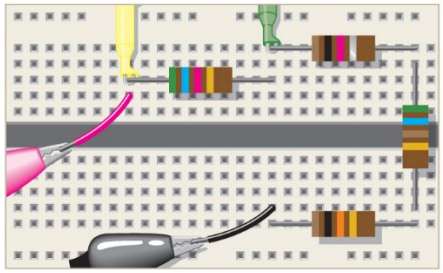
b. 8 = Vs x (R / R + +R + 2R + 3R + 4R)
8 = Vs x (R/11R)
8 = Vs x (1/11)
Vs = 88V

31. Find the total power in **Figure 4–75**.

Figure 4–75



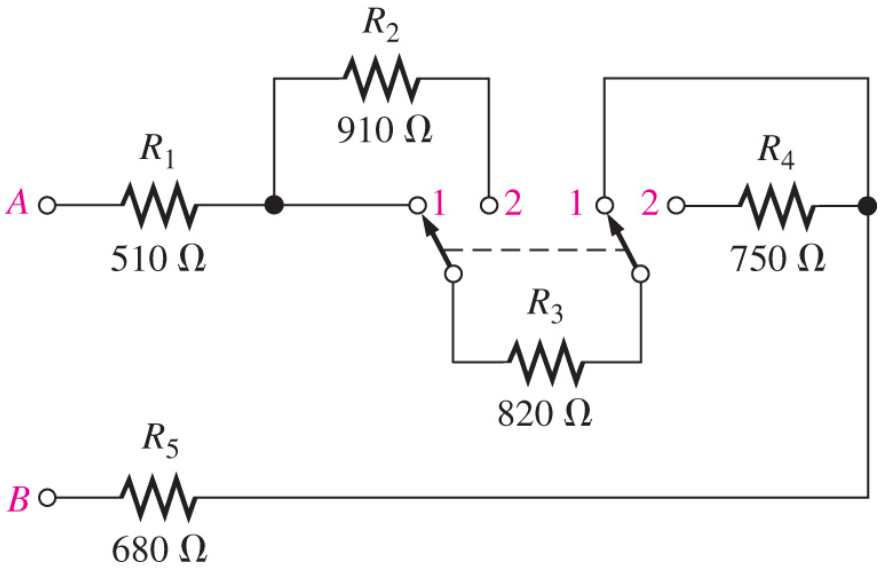
(a) Meter with leads going to protoboard



(b) Protoboard with meter leads (yellow and green) and power supply leads (red and black) connected

voltage= 10V
current = 10A
power = 10V*10A = 100 ohms

50. What is the total resistance from A to B for each switch position in Figure 4–84?



510 + 820 + 680 = 2010 ohms