JSGandora's Circuit Lab Test
~Answer Key~
Section I

1. Shunt Resistors
2. Multiplier Resistors
3. Because they reverse bias at their breakdown voltage.
4. Because the battery does not actually supply a force, it supplies a potential difference.
5. The batteries are damaged due to the incompatible voltages.
6. The voltages add up.
7. Kirchhoff's Current Law/Kirchhoff's first law/Kirchhoff's point rule/Kirchhoff's junction rule
8. Charles Wheatstone
9. Opposite direction
10. When the two potential difference between the nodes in-between the two resistors of each branch is zero.
11. Saturation Current
12. B
13. Diodes
14. Their areas "add up" so the capacitances "add up" by the capacitance formula.
15. The measure of resistance that is encountered when forming an electric field in a medium. IN other words, permittivity of a medium describes how much electric field/flux is "generated" per unit charge in that medium.
16.
    a. Voltage = kg*m^2/(s^2*C)
    b. Current = C/s
    c. Resistance = kg*m^2/(s*C^2)
    d. Capacitance = C^2*s^2/(kg*m^2)
    e. Charge = C
    f. Power = kg*m^2/s^3
17. 120 V

Section II

1. 6V
2. 60 Ω
3.
    a. 16.37 Ω
    b. 1127 W
4.
    a. 5/3 V
    b. 5/3 V
    c. 5/3 A
5.
    a. 5/12 Ω
    b. ½ Ω
6.
    a. 8/7 Ω
    b. 7/8 Ω

7. 3-√3/3
8. B
9. B
10. Diode
11. To measure an unknown resistance
12. Temperature, as temperature increases, more collisions with the atoms in the conductor occur which thereby increases the resistance of the material.
13.
   a. 0.001 seconds
   b. 0.893 A
   c. 0.000006 C
14. 0.000004 C
15. The Thévenin equivalent should have a voltage source of 3/8 V with a Thévenin resistor of 15/8 Ω in series to the load resistor.
   a. 15/8 Ω