**Assignment 7 – Circuits Name: …………………………………..**

1. Calculate the equivalent resistance between a and b. (2 marks)



1. Calculate the four currents in the circuit. Calculate the power dissipated by the battery. (7 marks).



1. Four resistors are connected to an 18 V battery as shown:



1. Calculate the current from the 18.0 Volt supply. (3)
2. Calculate the voltage across each resistor in the network. (4)
3. Calculate the power dissipated through each resistor. (5).
4. Study the circuit below:

*V*

1. Describe the effect of closing the switch between A and B. (2)
2. The switch is open. What type of circuit is it? Let *R*1 = 10 Ω and *R*2 = 20 Ω with a voltageof 18 V provided by the battery. Calculate the overall current in the circuit. (2)
3. Calculate the voltages across each of the resistors. (2)
4. The switch is closed. What is the current now? (2)
5. What is the voltage across
6. *R*2 (1)
7. The switch (1)
8. Explain why a short circuit can lead to a fire. What safety device can prevent a fire? (2)



1. The circuit above contains a battery with negligible internal resistance, a closed switch S, and three resistors, each with a resistance of R or 2R.

a. i. Rank the currents in the three resistors from greatest to least, with number 1 being greatest. If two resistors have the same current, give them the same ranking. (1)

 \_\_\_\_\_\_\_IA \_\_\_\_\_\_\_IB \_\_\_\_\_\_\_IC

 ii. Justify your answers. (1)

b. i. Rank the voltages across the three resistors from greatest to least, with number 1 being greatest. If two resistors have the same voltage across them, give them the same ranking. (1)

 \_\_\_\_\_\_\_VA \_\_\_\_\_\_\_VB \_\_\_\_\_\_\_VC

 ii. Justify your answers. (1)

 For parts c. through e., use $E $= 12 V and R = 200 Ω.

c. Calculate the equivalent resistance of the circuit. (2)

d. Calculate the current in resistor RC. (2)