Intro to Audio Engineering - Lab 2

Q1

The voltage drop across one of the resistors will half of the voltage across both resistors if both resistors are of equal value.

Q2

The voltage drop across the resistor that is ten times larger then the other will be 10/11 of the voltage dropped across both resistors. The voltage drop across the smaller resistor will be 1/11 of the voltage drop across both resistors.

Q3

A resistor in position R1 in figure 1 with a resistance that is 1/3 the value of a resistor in position R2 will cause the voltage to drop ¼ of it’s original value at point B. You can do this with multiples of the same resistor by putting four of them in series and measuring the voltage drop across the first resistor.

Q4

If you are measuring the voltage across V(out) to the wiper, then the wiper should be positioned as closed to the bottom of the bottom resistor as possible. This will cause the biggest resistance gap and therefore cause the largest voltage drop. The maximum voltage drop across V(out) to the wiper is 2.5 volts. This is due to the maximum accessible resistance for the wiper being 100kOhms, which would be equal to the value of the top resistor. The voltage drop across the top and the bottom resistor would then be equal when the wiper is at the bottom most position, causing the voltage drop across V(out) to the wiper to be half of the source voltage, which is 5 volts.

Q5

If the voltage is being measured across the V(out) to the wiper, the wiper would have to be at the top of the resistor in order to create the smallest voltage drop. The minimum voltage drop across V(out) to the wiper would then be 0, in an ideal world where there is no resistance between V(out) and the wiper.

Q13

At a high resistance, the voltage drop is almost the entire voltage drop across the circuit. At a low resistance, the voltage drop is the voltage drop across the load resistor, or no drop if there is no load resistor.

Q14

There is a relationship between the voltage dropped across the load resistor and the source voltage that is dependent on the changing load resistor. This is taking into account the stagnant variable resistor as a stable resistance. Once this relationship is established, the equation can simply be used to find the voltage drop across the changing load resistors. (I have established such relationships earlier in this lab)