Purpose: To investigate various combinations of resistors.

Apparatus: Three resistors, DMM (digital multimeter), and 5-banana plug wires.

Theory: When two or more resistances are connected in series the equivalent resistance, RS is given by;

|  |  |
| --- | --- |
|  |  |

When two or more resistances are connected in parallel the equivalent resistance, RP is given by:

|  |  |
| --- | --- |
|  |  |

Procedure:
1. Determine the values of the three resistors using [the resistor color code.](http://nearbus.net/wiki/index.php?title=File:Resistor_color_codes.jpg)
2. Measure the values of the three resistors using the [digital multimeter](http://www.youtube.com/watch?v=bF3OyQ3HwfU) (DMM).
3. Observe the tolerance values and record them in the data table.

|  |  |  |  |
| --- | --- | --- | --- |
|   | R1 | R2 | R3 |
| From resistor color code |   |   |   |
| From digital multi- meter |   |   |   |
| Tolerance |   |   |   |

4. Connect R1 and R2 in series and measure the equivalent resistance. Also calculate it.
5. Connect R1 and R2 in parallel and measure the equivalent resistance. Also calculate it.

|  |  |  |
| --- | --- | --- |
| Diagram | Measured | Calculated |
| R1 and R2 in series: |  |  |
| R1 and R2 in parallel: |  |  |
| 6. Rank the values of R1, R2, R1 series R2, R1 parallel R2 in descending order: |

7. Connect the three resistors in various combinations and obtain various values of resistances. Measure the equivalent resistances. Also calculate the equivalent resistances using the measured values for R1, R2, and R3.
8. Identify the lowest and highest resistance values in the table.

|  |  |  |
| --- | --- | --- |
| Resistor combination diagram | Resistance (R) Values | Rank the R values from High to Low |
| Measured | Calculated |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |