**Part 1: Building Circuits**

Build the circuits below and verify that it operates correctly by unscrewing each lightbulb one at a time and comparing the result with the table provided. Once the circuit set up has been confirmed, highlight the bulbs in the diagram to indicate if they are **Bright**, **Medium,** or **Dim**

# Circuit 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | B | C |
| A out | **X** | X | X |
| B out | X | **X** | X |
| C out | X | X | **X** |

 |

# Circuit 2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | B | C |
| A out | **X** |  |  |
| B out |  | **X** |  |
| C out |  |  | **X** |

 |

# Circuit 3

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | B | C |
| A out | **X** | X | X |
| B out |  | **X** |  |
| C out |  |  | **X** |

 |

Build the circuits below and highlight the bulbs to indicate if they are **Bright**, **Medium,** or **Dim**

# Circuit 4

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| A out | **X** | X | X | X |
| B out |  | **X** |  |  |
| C out |  |  | **X** |  |
| D out | X | X | X | **X** |

 |

# Circuit 5

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| A out | **X** | X | X | X |
| B out |  | **X** | X |  |
| C out |  | X | **X** |  |
| D out |  |  |  | **X** |

 |

# Circuit 6

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Unscrew the lightbulb indicated in the far left column of the table the corresponding bulbs that also turn off are marked with an X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| A out | **X** |  |  |  |
| B out |  | **X** |  |  |
| C out |  |  | **X** |  |
| D out |  | X | X | **X** |

 |

**Part 2: Measuring Circuits**

Build the following two circuits to learn how to use the voltmeter and ammeter

|  |  |
| --- | --- |
| Voltmeter* Set the meter to the “5V” setting
* Connect contacts “across” the component that you wish to measure the voltage for
* This voltmeter only measures in the positive direction so if the needle doesn’t move, try flipping the meter or the power supply

 |  |
| Measured Voltage |  |
|  |
| Ammeter* Set the meter to the “1A” setting
* Connect contacts “in line” with the component that you wish to measure the current for
* This ammeter only measures in the positive direction so if the needle doesn’t move, try flipping the meter or the power supply

 |  |
| Measured Current |  |

## Setting up the Voltage

The power supply has three different settings to produce voltage. See the diagram below for the contacts to use to produce 3, 5, and 6 volts.

###

# Circuit 1

|  |  |
| --- | --- |
| Build the circuit below and take the following measurements | Measure the voltage using the Voltmeter |
|  | Voltage across 1 |  |
| Voltage across 2 |  |
| Voltage across 3 |  |
|  |  |
| Measure the current using the Ammeter |
| Current at point A |  |
| Current at point B |  |
| Current at point C |  |
| Current at point D |  |

# Circuit 2

|  |  |
| --- | --- |
| Build the circuit below and take the following measurements | Measure the voltage using the Voltmeter |
|  | Voltage across R1 |  |
| Voltage across R2 |  |
|  |  |
| Measure the current using the Ammeter |
| Current at point A |  |
| Current at point B |  |
| Current at point C |  |
| Current at point D |  |