1 (15 points) Briefly explain how do you read values of resistors using color codes?

\[ R = (1^{st} + 2^{nd}) \times 10^{3rd} \pm 4^{th} \text{th is reliability} \]

if there is no 4th \( \Rightarrow \) tolerance is 20%

2 (15 points) Draw a circuit which could be used to measure large resistors.

[Diagram of circuit with DMM, V, and R_large]

3 (15 points) Draw a circuit which could be used to measure small resistors.

[Diagram of circuit with DMM, V, and R_small]

4 (20 points) How do you measure resistance of your body (write the governing formula also)?

[Diagram of circuit with R_hand, R_comm, and R_DMM]

measured \[ R_{DMM} = \frac{R_{R_body}}{R_{R_body} + R_{DMM}} \Rightarrow R_{R_body} \]

5 (15 points) Briefly explain the operation of DMM when it is used as ohmmeter.

There is a battery inside DMM, when we set the rotating knob of DMM on \( \Omega \) the battery will be in the circuit and when we connect a resistor across DMM, the battery send a current to display of DMM. The current is calibrated aligned with value of resistor.

6 (20 points) How do you calibrate DC milliammeter to measure current larger than its' range (write the governing formula also)?

[Diagram of circuit with I_m, R_shunt, and R_m, DC milliammeter]

\[ \Rightarrow R_{shunt} \]