Parts Needed:
- 1 x 2N3904 transistor
- 1 x green LED
- 1 x 100 Ω, 1 x 10k Ω
- 5 V power supply, 1 x DMM
- 1 x bread board

Test LED
1. Set the DMM to Ohm measurement; connect the two probes to the LED, write down the measured resistance ______ ohms. Then, reverse the probes to make another measurement ______ ohms. Note the low resistance measurement, its red probe is Anode of the LED. OR
2. Insert Rc 100 Ω into the bread board, put it in series with green LED, then connect the anode of LED to +5 V and the other end of Rc to negative side of the power supply. If green LED is not on, reverse the direction of the green LED to make sure the LED is on. Replace LED if necessary

Configure and Measure the LED Switch
1. Study the LED switch circuit as shown in Figure 1. And note the input and output equations:

\[ S = I_B R_B + V_{BE} \]  --- Input equation
\[ V_{CE} = I_c R_c + V_{LED} + V_{CE} \]  --- Output equation

Where
- \( V_{BE} \) – voltage drop across base and emitter
- \( V_{LED} \) – voltage drop across the LED
- \( V_{CE} \) – voltage drop across collector and emitter
2. Connect all the parts on the bread board, as shown in Figure 2.

3. Turn on power supply then use DMM (volt measurement) to measure $V_{CE} =$ _______, $V_{BE} =$ _______, $V_{LED} =$ _______.

4. Use DMM (mA measurement) to measure $I_C =$ _______ mA and $I_B =$ _______ mA.

5. Compute $I_C = (V_{CC} - V_{LED} - V_{CE})/RC =$ _______ mA.

6. Compare and verify the measured $I_C$ and computed $I_C$. 