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Part I:

6a) From V=IR > I=V/R > I=5/1 > I=5 Amps. This is more than the 2 Amps the adapter is rated for.

6b) Connecting this would melt the wires of the circuit and parts of the Rpi.

7a) No, with 5V and 100 Ohms, we'd expect 0.05A, but our meter is reading much lower; closer to 0.005A

Part II:

1b) The drop across the resistor is ~0.6V. x

1c) The drop across the LED is ~4V.

2a) The brightness should increase, which it does.

3a) We measured: 1.5V on the resistor, 3.4V with the 330 Ohm resistor. 2.1V across the resistor, 2.9 across the LED with the 1 kOhm resistor. 2.4V across the resistor and 2.6 across the LED with the 5.6 kOhm resistor.

4a) The brightness should decrease, which it does.

5b) The brightness should increase, which it does.

6) One way to measure brightness could be to measure how many volts the LED draws. In this case, with the increased voltage and the 5.6k Ohm resistor, the LED now draws 3.6, and is about as bright as it was when we set it up in 1c's configuration.

7) With green and the 5.6 kOhm resistor, the drop is 2.3V. With a red LED and the 5.6k Ohm resistor, the drop is 1.7V. The relative brightness to the naked eye reflects these voltages. Blue seemed brightest, green in the middle, and red seemed the dimmest.

Part III:

2) 0.18V across the resistor.

3a) 0.05V across the resistor means ~9E10^-6 A.

3b) 5V and 3.3V are both enough to see a difference in voltage across the resistor.

3c) With the step up, it goes from 0.35V when uncovered to 0.042V when covered, so there is still a difference.

4) (With step up) 46.2V when uncovered, translating to about 0.00825A. 0.38V when covered, translating to about 0.00007A