Electronics Level 1

BREADBOARDING ANSWER BOOKLET

_____
Name

Directions:

Go to the Mark R. Isfeld Maker Website (http://makerspace.isfeldschool.com/electronics-robotics-9/) and complete each Beginning Breadboard lab one at a time. Once the breadboarded circuit is working, the wires are **FLAT** and **HORIZONTAL/VERTICAL** answer the questions below that pertain to that lab, then take **BOTH** the breadboard **AND** the booklet to the teacher and have it marked!
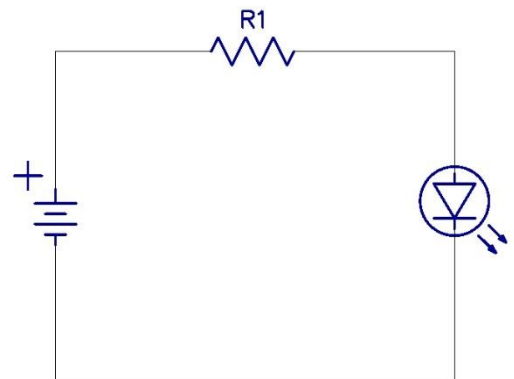
Marking:

Marks are taken off for;   Messy breadboarding (wires not flat, straight and/or horizontal/vertical)
Incorrect parts placement (wrong order)
Incorrect answers

Lab #1 - How a resistor works

Answers:

a) The dimmer the LED, the _____ the value of the resistor.

b) The brighter the LED, the _____ the value of the resistor.

c) The lower the voltage, the _____ the LED.

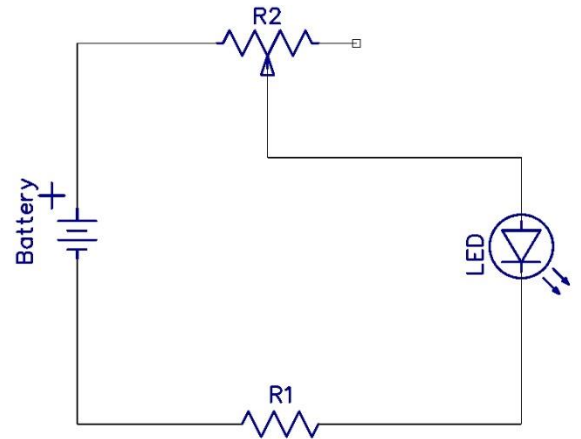d) The brighter the LED, the _____ the current flow.

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Lab #2 - Potentiometer

Answers

a) A potentiometer is a variable _____.

b) By adjusting the potentiometer from one end to
another, the brightness of the LED _____.

c) When the potentiometer is at 0 ohms, the LED is
_____.

d) When the potentiometer is at 100K ohms, the LED is _____.

e) As you adjust the potentiometer from 0 ohms to 100K ohms, the _____
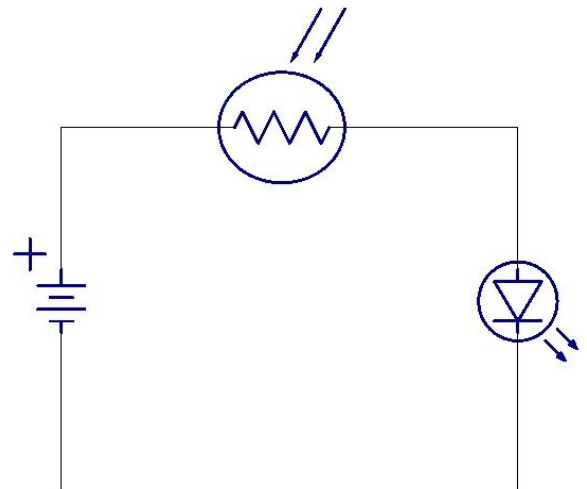changes causing the LED to get _____.

Mark   /10

Lab #3 - Photocell

Answers

a) When you put your hand over the Photocell the
LED gets_____.

b) The more light that strikes the Photocell, the
_____ the LED gets.

c) The less light that strikes the Photocell, the
_____ the LED gets.

d) The less light that strikes the Photocell means the
resistance of the Photocell _____which causes the LED to get
_____.

e) The more light that strikes the Photocell means that the resistance in the circuit
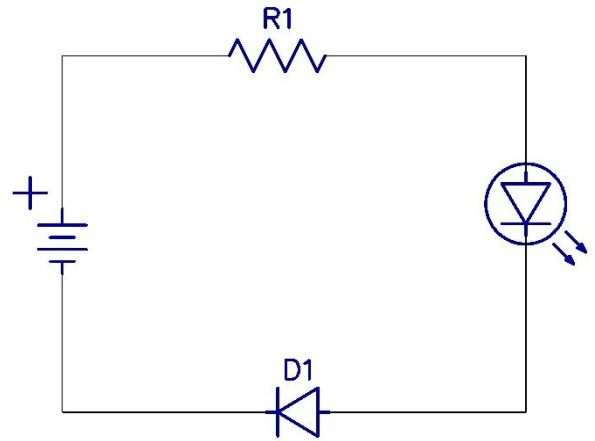_____ which causes the LED to get _____.

Mark   /10

❑   Mr. Claassen
❑   Fall 2017

Lab #4 - Diode

Answers

a) A diode allows current to flow through it in only
   _____ direction.

b) A diode has two ends, the _____
   and the _____.

c) When the _____ is connected to
   negative, the LED will light up.

d) If the _____ is connected to negative, the LED will NOT light up.
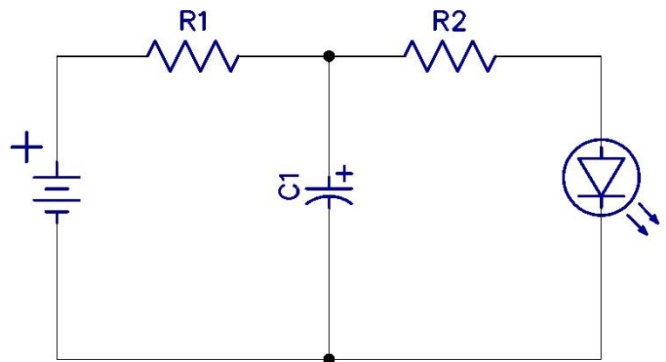
Mark   /10

Lab #5 - Capacitors

Answers

a) A capacitor stores _____.

b) Once you disconnect the power to the circuit,
   the LED will _____ for a
   while because of the stored electrical energy in
   the capacitor.

c) The greater the value of the capacitor, the _____ the LED will stay on.

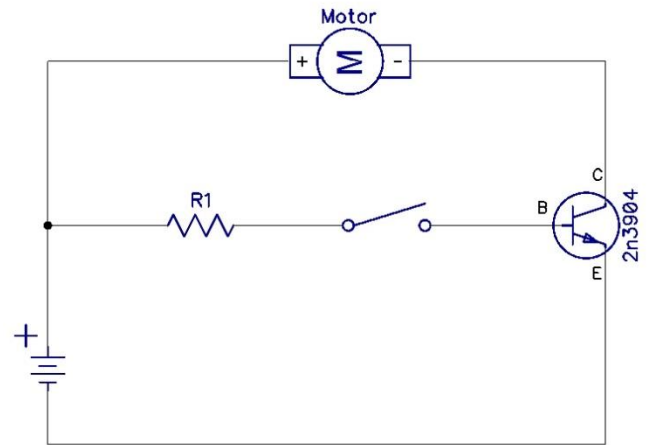d) When current flows through the circuit, what is happening to the capacitor?

Mark   /10

Lab #6 - Transistors

Answers

a) A transistor has three legs, the_____,
   _____ and _____

b) A transistor works as a _____
   amplifier.

c) The transistor uses a small _____
   current to control a larger _____ current.

d) The larger the value of R1, the
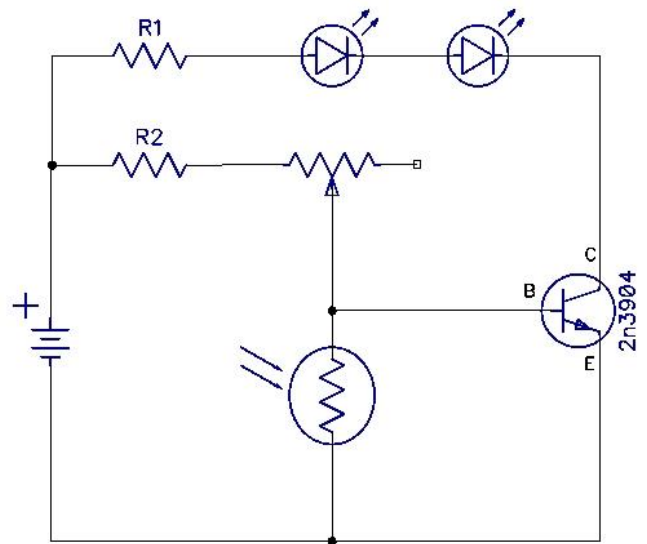   _____ the speed of the motor

Mark   /10

Lab #7 – Automatic Nightlight

Answers

a)   When the light hits the photocell the LED's
      are _____.

b)   The less light on the photocell, the
      _____ the LED's are.

c)   The LED's are connected to the
      _____ of the transistor.

d)   The potentiometer is used to adjust the
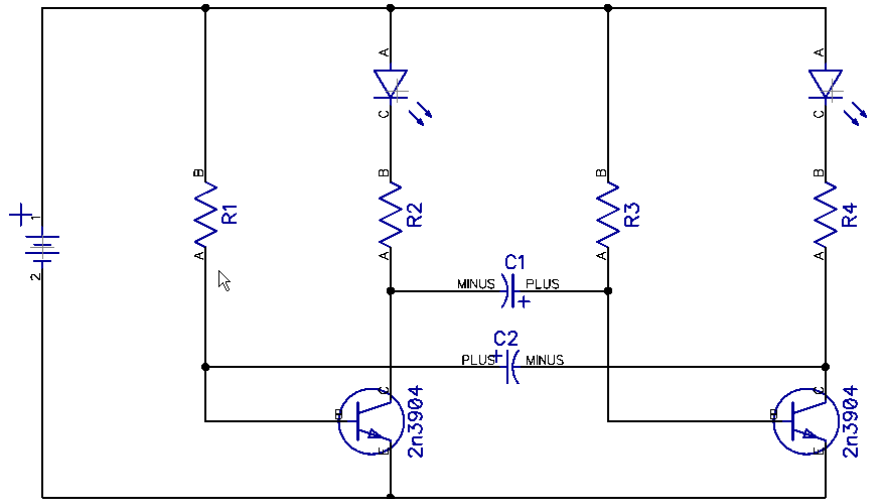   _____ of the device.

Mark   /10

Lab #8 – Flashing Lights

Answers

a) When a 100uf capacitor is substituted for the 10uf capacitor, the frequency the LEDs flash will

_____.

b) If you substitute the 470 resistors with 6.8K resistors the brightness of the LEDs would

_____.

c) The cathodes of the LEDs are connected to the _____.

d) The negative leads of the capacitors are connected to the _____ and the _____.
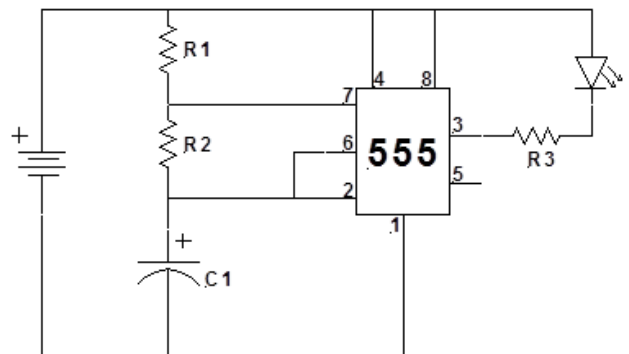
Mark   /10

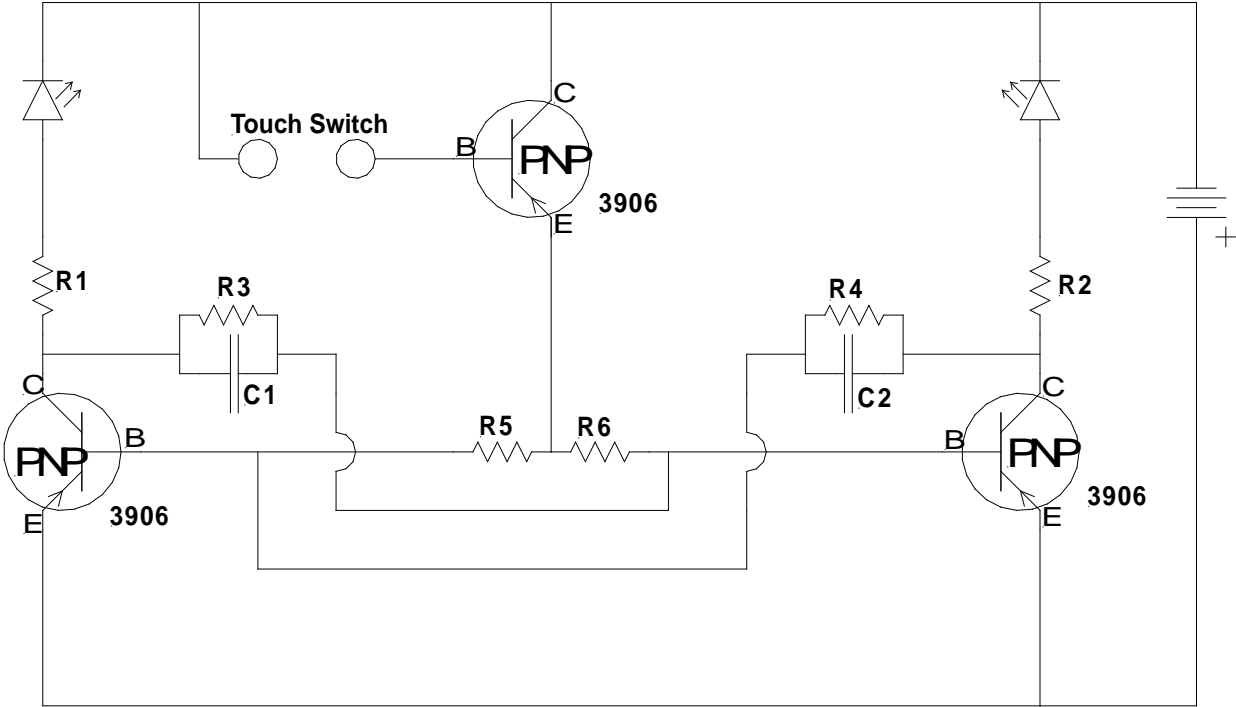# Lab #9 – 555 Integrated Circuit

Answers

a) The output of this circuit (pin #3) produces a _____ and _____ voltage alternately that cause the LED to flash.

b) The frequency at which the LED blinks is controlled by _____, _____ and _____.

c) The larger the values of the resistors and capacitor, the _____ the frequency of pulses.

d) What happens if the value of R1 is bigger than R2?

Mark   /10

BONUS Lab – Two LED Decision Maker

Touch Switch

C
B **PNP** 3906
E

R1
R3
C1
C
B **PNP**
E 3906

R5   R6

R4
C2
B **PNP** C
E 3906

R2

Mark   /5