

ECE1008 (SENSORS & CONTROL SYSTEMS) EXPERIMENT – 7

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AIM –

Flex sensor designing

MATERIALS REQUIRED –

Bread board, connecting wires, flex sensor, transformer, LED, multimeter.

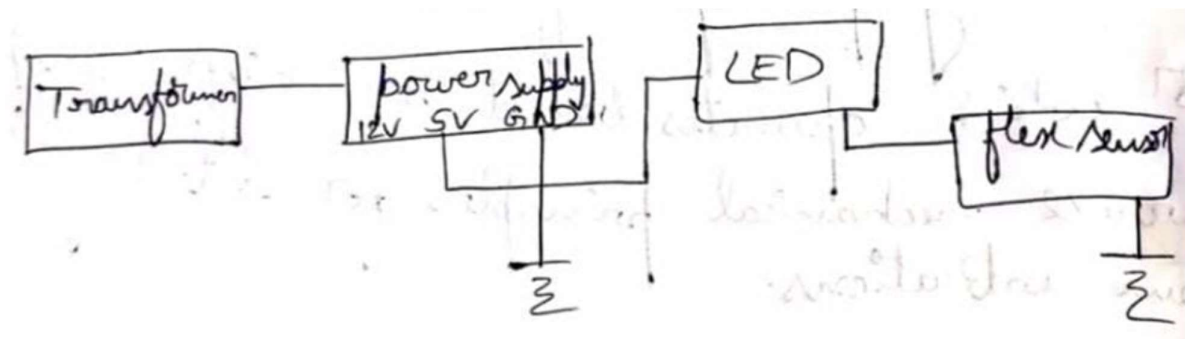
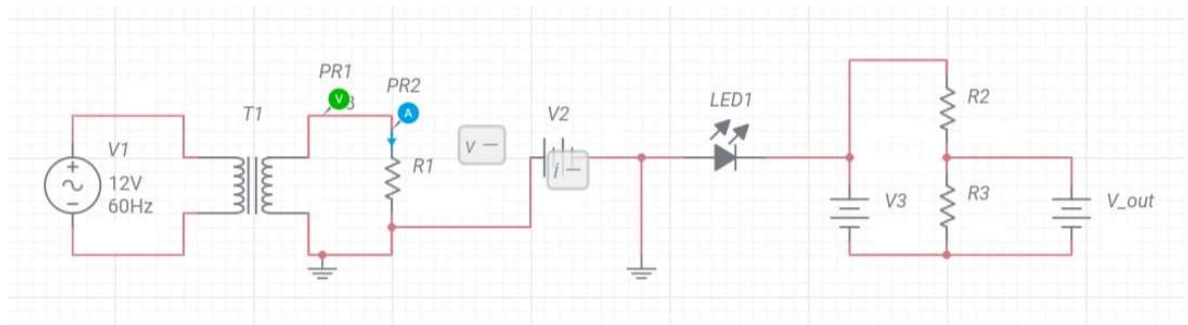
WHAT IS FLEX SENSOR ?

A flex sensor or bend sensor is a sensor that measures the amount of deflection or bending. Usually, the sensor is stuck to the surface, and resistance of sensor element is varied by bending the surface.

PROCEDURE –

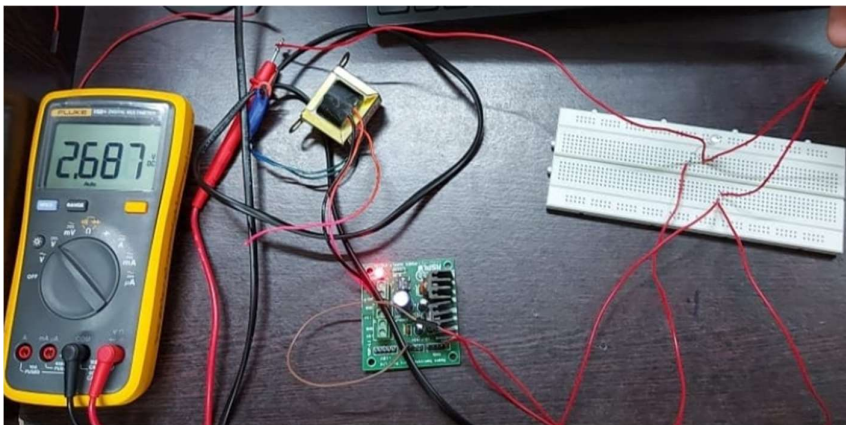
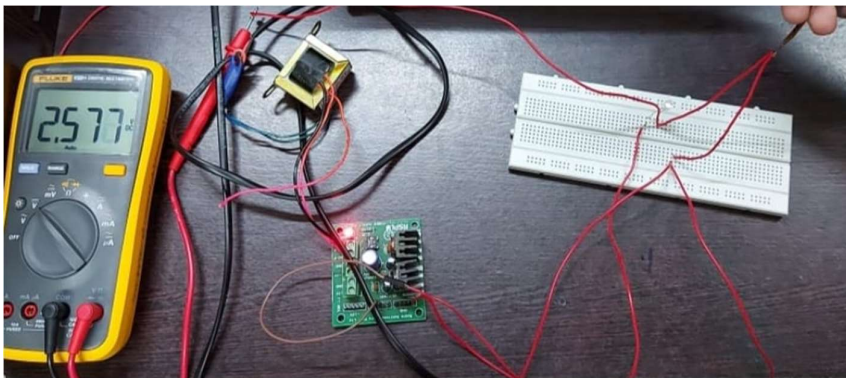
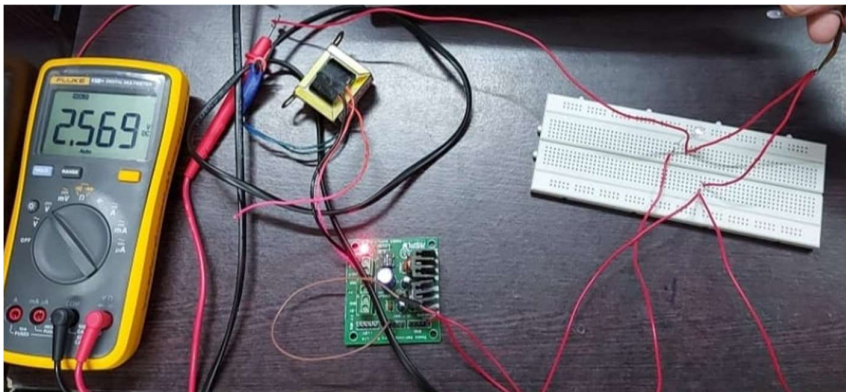
1. Connect LED positive terminal to 5V of power supply.
2. Connect LED negative terminal to flex sensor positive pin.
3. Ground the negative pin of flex sensor with the power supply ground,
4. Switch on the power supply.
5. Note the reading of multimeter in DC volts,
6. Place the positive wire of multimeter to positive of LED and negative wire of multimeter to negative terminal of LED.
7. Bend the flex sensor in many angles.
8. Observe the voltage readings and intensity of LED.

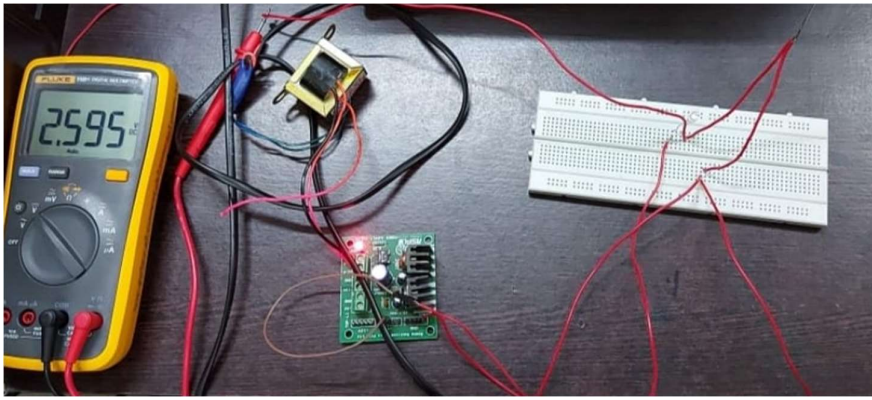
CIRCUIT DIAGRAM –



WORKING –

This sensor device works on the principle of bending the strip away from the ink. When the strip is bent then its resistance is changed which is measured with any controller. In other words, this sensor works like a variable resistance whose resistance is changed when it is bent. This change in resistance depends upon surface linearity, which means the resistance of this sensor would be different at different angles. When the sensor is flat (no bending) the resistance is lowest and at a nominal value. The resistance increases linearly as the bending angle increases. When the bend in a flex sensor is 45 degrees then the resistance would be double as compared to when it was flat. Similarly, when the bend in the sensor is 90 degrees then the resistance would be double as compared to 45 degrees and four times as compared to when it is flat. So, if we talk about ratio then this resistance is directly proportional to bending angle means it increases linearly.





OBSERVATION TABLE –

Angle	Voltage
<i>Backward Fold</i>	
0	2.447
45	2.442
90	2.440
180	2.430
<i>Forward Fold</i>	
45	2.442
90	2.452
180	3.566

APPLICATION –

It is used to restrict the bend of the optical fibers, used in robotics, medical industries etc.

CONCLUSION –

We can see that, when the flex sensor is bending, voltage gets changed and LED's glowing intensifies by the change of the bending of flex sensor.