ECE1008 (SENSORS & CONTROL SYSTEMS) EXPERIMENT – 9

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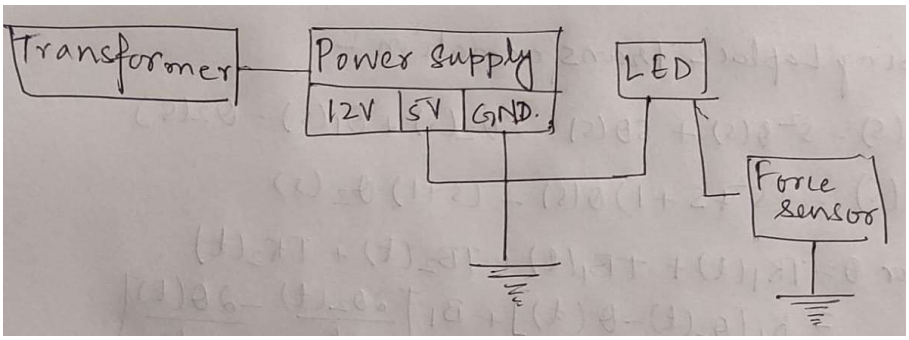
AIM –
Design force/weight sensor circuit

MATERIALS REQUIRED –
Bread board, connecting wires, force sensor, transformer, LED, multimeter.

WHAT IS FORCE SENSOR?
A force sensor is defined as a transducer that converts an input mechanical load, weight, tension, compression, or pressure into an electrical output signal. Force sensors are also commonly known as force transducers.

CIRCUIT DIAGRAM –

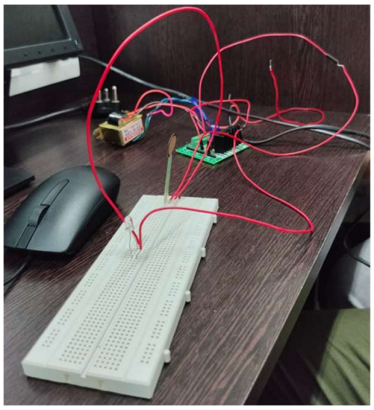


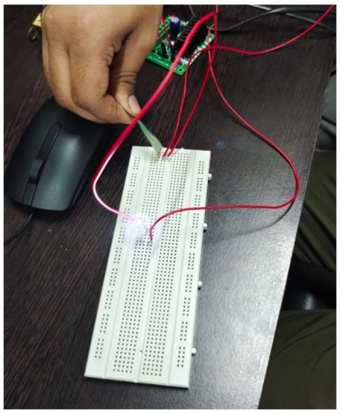
PROCEDURE –

1. Connect the positive terminal of LED to 5V of power supply and negative to force sensor.
2. Connect another pin of force sensor to ground of power supply.
3. Switch on the power supply.
4. Place the multimeter positive wire to LED positive and negative wire to LED negative.
5. Keep the multimeter in DC volts.
6. Observe the readings of multimeter at starting and when the force is applied on sensor and intensity of the LED increases.

WORKING –

The working principle of force sensor of a force sensing resistor is based on the property of ‘Contact Resistance’. Force-sensing resistors contains a conductive polymer film that changes its resistance in a predictable manner when force is applied on its surface. When force is applied to the surface of this film, the micro-sized particle touches the sensor electrodes, changing the resistance of the film. The amount of change caused to the resistance values gives the measure of the amount of force applied.





APPLICATION –
Some of the applications of force sensor that uses force-sensing resistors includes pressure-sensing buttons, in musical instruments, as car-occupancy sensors, in artificial limbs, in foot-pronation systems, augmented reality etc.

CONCLUSION –
When there is no force applied on sensor, voltage is in negative and when we apply force on sensor voltage gets increased and the intensity is also increased.