

## **1. Introduction** *(100 words maximum)*

The project chosen for this task is a sensor gate. It uses an ultrasonic sensor to detect nearby object and a microcontroller controls a 6V motor depending on the proximity of the object.

### **1.1 Objectives**

The goal of the sensor gate is to detect objects within a 10cm range and cause the motor to move. The sensor gate does this by transmitting a sound signal that bounces off objects and gets detected by the sensor when it returns. This sound signal is timed and the speed of sound in air is used to calculate the distance the sound signal travelled which is the distance from the sensor the object ( $d = s \times 0.5t$ ).

### **1.2 Significance**

The project overall was modelled to resemble gate sensor systems that detect nearby objects and open a gate. Similar but more sophisticated systems are used in shopping Centre gates and sliding doors. The project brought out learnings in Electrical Engineering through the aspects of circuit construction and soldering. Concepts from Programming Fundamentals (CSP2151) were also brought out through writing and editing code for the microcontroller that was used. The code was partly sourced from the Arduino website and edited to perform the required function.

## **2. Proposed circuit** *(150 words maximum)*

Components were selected and connected according to the circuit diagram below. The initial microcontroller was faulty. The circuit was tested and checked until it was realised that the microcontroller needed to be changed.