

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

Tools and sensors to be needed in this project :

#### 1. Entrance Gate

For entrance gate there are two ultrasonic sensors and one motor servo for the gate. The entrance gate can be open or close based on condition ultrasonic sensors.

The entrance gate will be assembled and test as a module. Test program for entrance gate, the program is uploaded into the micro controller with ultrasonic sensors and motor servo, then the gate can be open or close.

#### 2. Weighbridges

For weighbridges there are one load cell, one module HX711, three buttons, three LED, and GSM Shield for the weighbridges. The clerk push the buttons based on vehicle category and then weighed in load cell, if vehicle have maximum load, the LED is turn on, and data from vehicle will be uploaded to IoT server, then the vehicle turn into the specified path.

The weighbridges will be assembled and test as a module. Test program for the weighbridges, the program is uploaded into the micro controller with load cell, HX711, three buttons, three LED, and GSM Shield, then the clerk can push the buttons based the vehicle category and the data uploaded to internet.

#### 3. Exit Gate

For exit gate there are one load cell sensor and one motor servo for the gate. The exit gate can be open or close based on condition load cell sensors.

The exit gate will be assembled and test as a module. Test program for the exit gate, the program is downloaded into micro controller with load cell sensor and motor servo, then the gate can be open or close.

#### 4. Test Program

The entrance gate module, weighbridges module, and exit gate module are assembled into one set. If there are vehicles sign in, the entrance gate can be open or close based on condition ultrasonic sensors. Then the vehicle weighed with load cell. Data from load cell can be uploaded to internet using GSM Shield. Then if the vehicle have maximum load, the LED is turn on. Then the vehicle turn into specified path. If the vehicle does not have maximum load, then the LED is turn off, and the exit gate is open.

