Digital Circuit and System Design

Project :- Traffic Light control system

Team Members :- Patel Manav (22JE0670)
Riyanshi Gupta (22JE0814)

AIM :- Hardware implementation of Traffic Light control system using 555 timer and cd 4017.

Components Required :-

- Solderless Breadboard
- 555 Timer
- Cd4017 Shift Register
- Resisters (100 ohm * 3 ,1000 ohm , 10,000 ohm)
- Potentiometer
- Capacitor (100uf *2)
- LED lights
- 4007 Diode
- 1N4148 Diode * 11
- Battery 9V

Theory :-

This Traffic Light circuit is designed based on a counter IC, which is mainly used in sequential circuits where a sequential circuit is used to count the numbers in the series. This way, we may call it a sequential traffic light system.

The working and operation of traffic lights control circuit, the main IC is 4017 counter IC which is used to glow the Red, Yellow and Green LED respectively. The 555 timer acts as a pulse generator providing an input to the 4017 counter IC.

The glowing time of certain LED lights totally depends upon the 555 timer's pulse, which we can control via the potentiometer, so if you want to change the time of glow for a specific LED, you can do so by varying the potentiometer which is used to handle the setting of timing durations.

As the LED are not connected directly with the 4017 counter, hence the lights won't be stable all the time. For this reason, we have used the combination of 1N4148 diodes and the LEDs in order to get the appropriate output lighting signals. The Main drawback of this circuit is that you are unable to set an exact timing using this configuration, however you will have the accurate estimated time period during the circuit operation.

Circuit Diagram :-