Sub-Group: A-7
Experiment 5: Study of 555 Timer IC

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1 Aim:

Study of 555 Timer IC as Astable multivibrator with different frequency.

2 Theory:

Pin Functions:

1. **Trigger Input:** When it is less than $V_S/3$ it makes the output high V_S. It monitors the discharging of timing capacitor in astable circuit.

2. **Threshold Input:** When it is greater than $2V_S/3$, it makes the output low (0 V). But this only happens if the trigger input is more than $V_S/3$. If the trigger input is low then it forces the output to be high. This input monitors the charging of time capacitor in astable and monostable circuit.

3. **Reset Input:** When it is less than 0.7 V, it makes the output low(0 V), overriding other inputs. When it is unnecessary it should be connected to the source voltage.

4. **Control Input:** If there is a need to change the threshold voltage which is normally set to $2V_S/3$, usually this is connected to 0 V with a very low capacitor of 0.01 μF to avoid electrical noise.

5. **Discharge Pin:**

2.1 555/ 556 Astable Circuit:

Time period (T) of the square wave is the time for one complete cycle. And frequency (f) of the wave is no. of complete cycles per second.

$$T = 0.7(R_1 + 2R_2)C_1$$
$$f = \frac{1.4}{(R_1 + 2R_2)C_1}$$

Time period can be split into two part, when the output is high, **mark time** (T_m) and when the output is low, **space time** (T_s).

$$T_m = 0.7(R_1 + R_2)C_1$$
$$T_s = 0.7R_2C_1$$

3 Data and Analysis