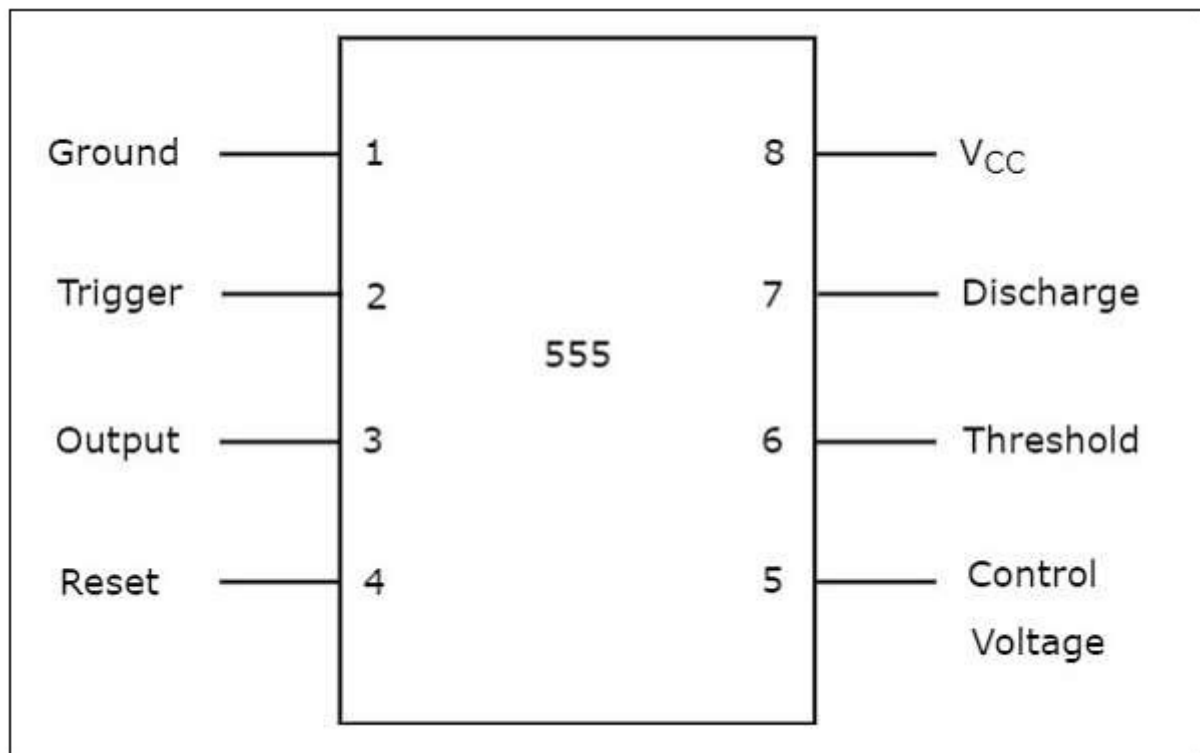


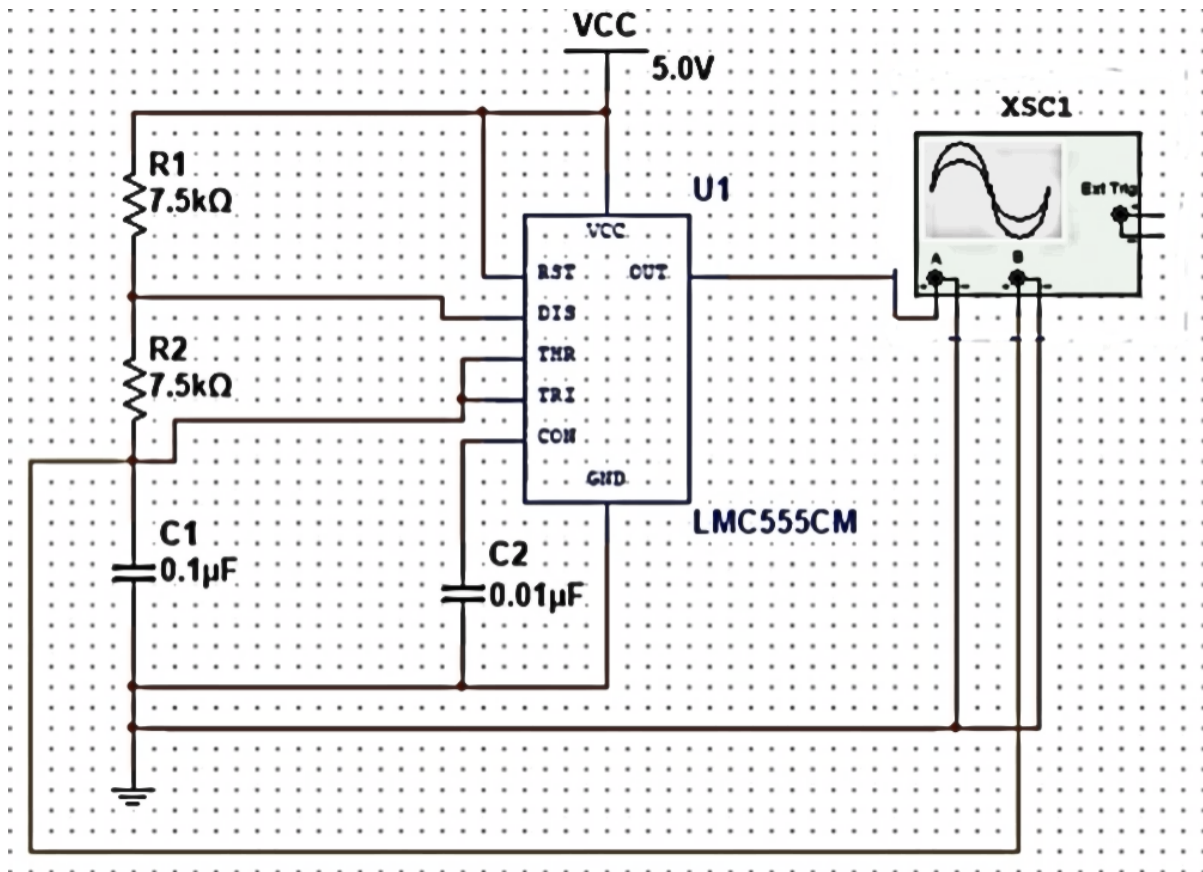
Experiment 12 :

- **Aim** : Design a ROM(8x4) using a decoder, gates and diodes.
- **Software Used** : NI Multism 14.2 software.

Pin Diagram :



Circuit Diagram :



Theory :

Applications such as oscillators, pulse generators, ramp or square wave generators, multivibrators require a circuit capable of timing intervals. The most popular circuit is the 555 timer. The IC is consisting of combinations of linear comparators and digital flip flops. The IC 555 is reliable and easy to use for various applications. The entire IC is housed in eight pin package. The IC can operate from 5 to 18 V. The timer IC 555 consist of two transistors, two comparators, three equal resistors, flip flop and output stage. A series connection of three equal resistors sets the reference voltage level of the two comparators at $2V_{CC}/3$ and $V_{CC}/3$ the output of these comparators setting or resetting the flip/flop unit. The IC timer 555 has two operational modes, monostable or astable multivibrator. The IC 555 available in two packages DIP and TO99.

Duty cycle is the ratio of on time to total time of the waveform.

Duty cycle of the square wave is 50%.

Result :

1. 555 Astable Multivibrator

V _c	R _a (kΩ)	R _b (kΩ)	C(μF)	F _{out} (kHz)	T _{high} (ms)	DutyCycle (%)	V _{out_max} (V)
12	10	10	1	0.048	20.833	66.66	12
12	22	24	3	0.0068	145.833	65.7142	12
12	44	45	5	0.0021	465.277	66.4179	12
12	42	41	4	0.0029	344.44	66.9354	12
12	11	25	9	0.0026	381.25	59.016	12

2. 555 Monostable Multivibrator

V _{cc}	V _{in}		R _a (kΩ)	C(μF)	T _{on} (mS)	T _{out} (mS)	V _{out_max} (V)
	T _{off} (mS)	T (ms)					
12	1	100	10	1	100	11	12
12	1	100	22	3	100	72.6	12
12	1	100	44	5	100	242	12
12	1	100	42	4	100	184.8	12
12	1	100	11	9	100	108.9	12

Conclusion :

Monostable and astable oscillator has been implemented successfully using IC 555.