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THIRD YEAR

SECTION : 'I'

ROLL NO. : 01

ENROLLMENT NO. : 12019009001127.

ANALOG ELECTRONICS CIRCUIT LAB (DAY 5).

ASSIGNMENT : 5

(Experiment No. : 05)

Date : 10.09.2021

University of Engineering & Management, Kolkata.

Experiment No. : 5
Date :- 10.09.2021.

Title :- Study of timer circuit using NE 555 and configuration of Monostable and Astable Multivibrator.

Aim :- The aim of this experiment is to study the multivibrator of different types such as Monostable and Astable using the NE 555 IC.

Apparatus Required : (i) Resistors.
                                 (ii) Capacitors
                                 (iii) DC power source (5v)
                                 (iv) Ground
                                 (v) LED
                                 (vi) NE 555 IC
                                 (vii) voltmeters.

Theory :- The 555 timer is widely used as IC timer circuit and it is the most commonly used general purpose linear integrated circuit. It can run in either one or two of the modes, Monostable (one stable state) or Astable (no stable state). In the monostable mode it can produce rectangler waveforms with a variable Duty cycle. The simplicity and ease with which both the multivibrator circuits can be configured around this IC is one of the main reasons for its wide use. Design of an Astable multivibrator using 555 timer IC generating non-sinusoidal waveform in the form of ramp waveform.

Timer NE 555's pin details —
① Ground pin — pin 1.   ④ Reset — pin 4.
② Trigger input — pin 2.   ⑤ control — pin 5
③ output — pin 3.   ⑥ Thresold — pin 6.
⑦ Discharge — pin 7   ⑧ +VCC — pin 8.

Astable Multivibrator :- These circuits are not stable in any state and switch outputs after predetermined time periods. The result of this is that the output is a continuous square/rectangular wave with the properties depending values of external resistors and capacitors. One of the most common application of an astable multivibrator is to generate time delays. Let's say you want to turn an LED "ON" for 1 second and keep it off for 0.5 seconds. and then an astable multivibrator is the best circuit you could see to build this application. This circuit does not require any external trigger to change the state of the output, hence the name. free-running.

Monostable Multivibrator :- A monostable multivibrator is a pulse generating circuit having one stable and one quasi-stable state. Since there is only one stable state, the circuit is known as "monostable multivibrator". The duration of the output pulse is determined by the RC network connected externally to the 555 timer. The stable state output is approximately zero at a logic-low level. An external trigger pulse forces the output become high or, approx. VCC.

Procedure :- (i) Open Multisim Live simulator in your brow-
                              ser and click on the new circuit.
(ii) Create the circuit using the components mentioned before and place them accordingly.
(iii) After placing all the components, connect them using the wires.
(iv) After connecting the wires, run the simulator and from the grapher get the graph as per the circuit
(v) From the grapher we can visualize the Monostable and Astable multivibrator and can provide the conclusion
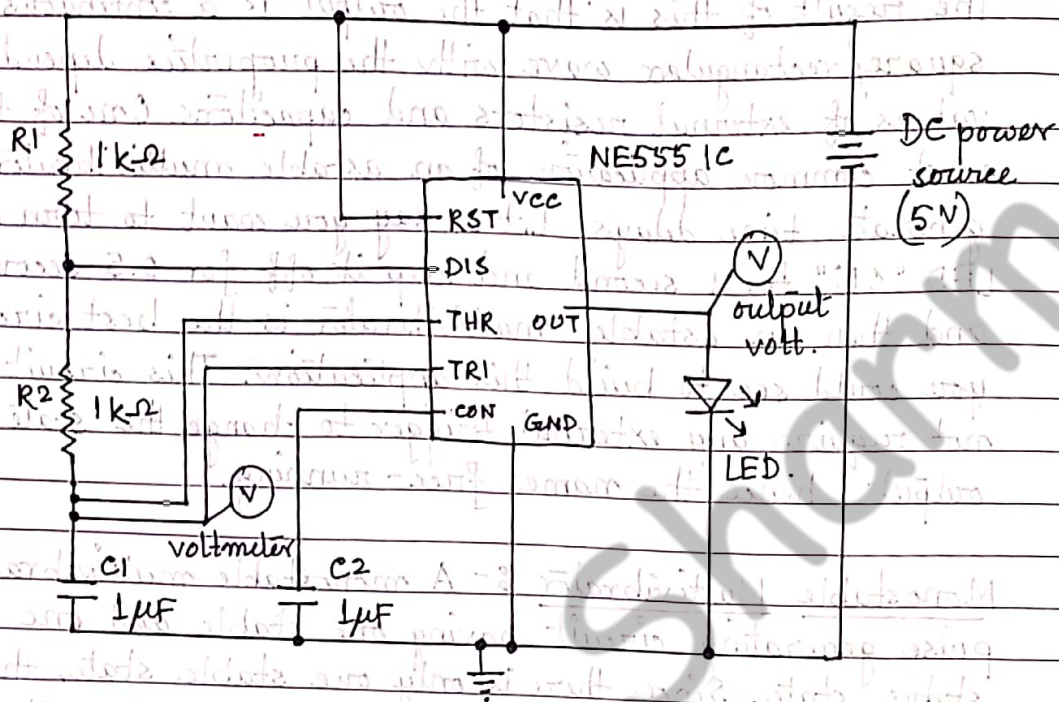
Circuit Diagram :-

Fig : Astable Multivibrator using NE 555 IC circuit.
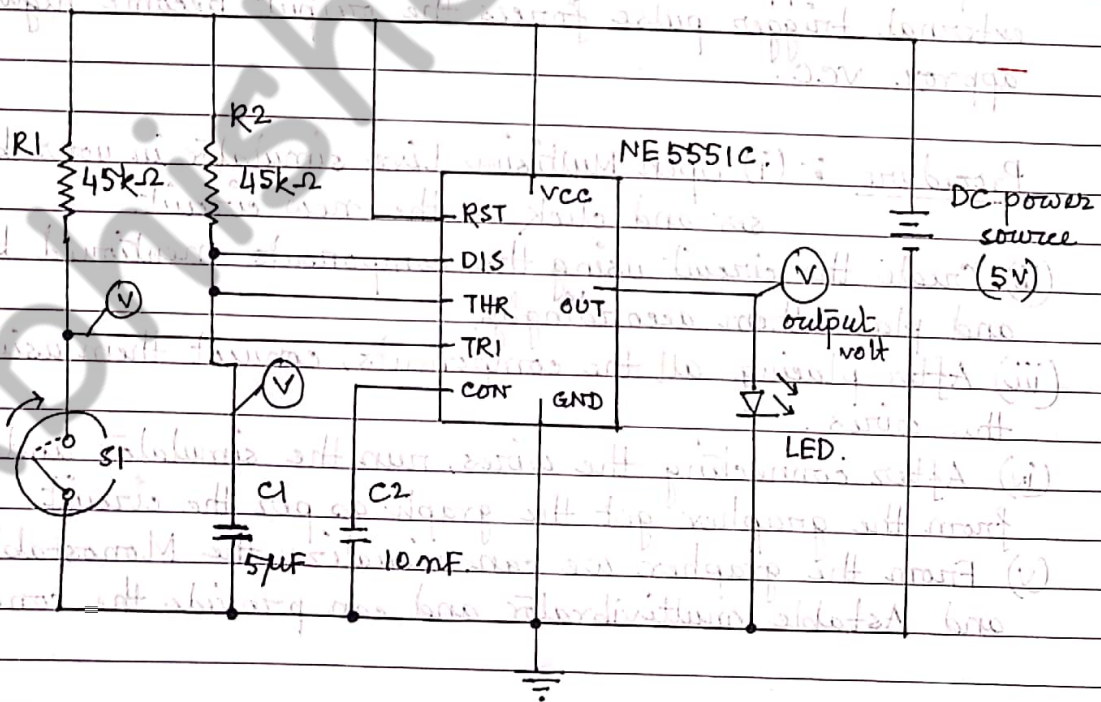

Fig :- Monostable Multivibrator using NE 555 IC circuit
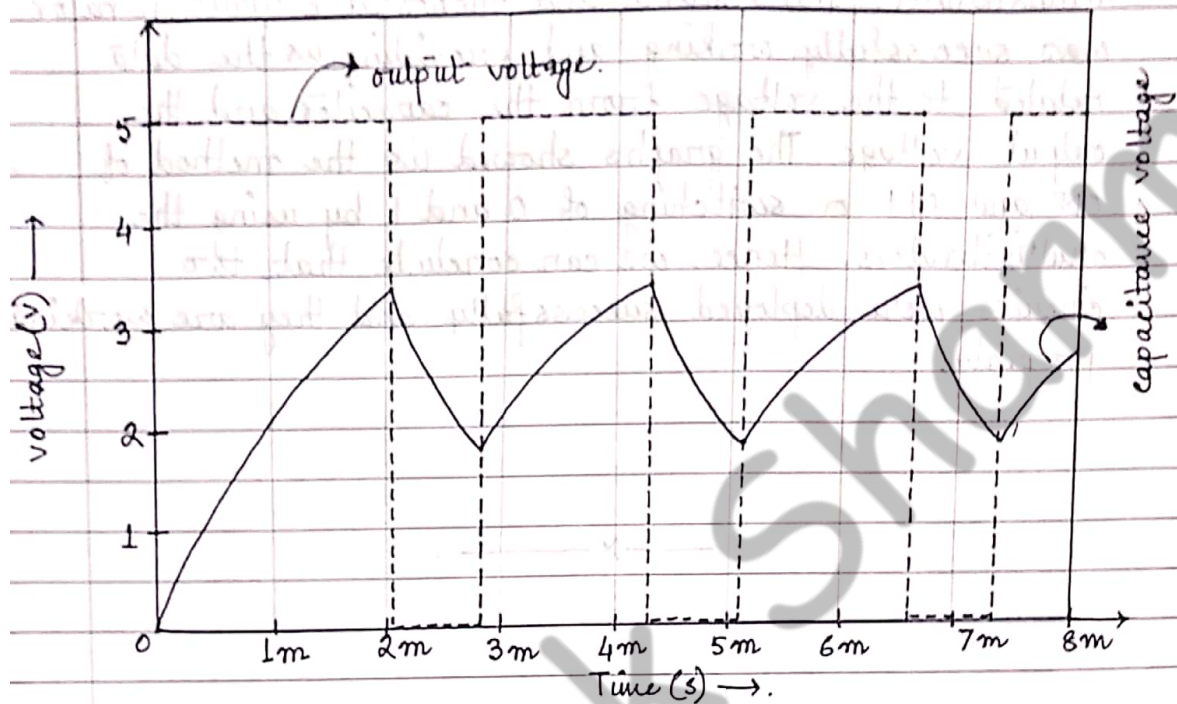
Graphs :-

① Astable Multivibrator using NE 555 IC :-

Fig : Astable Multivibrator using NE555 IC graph (Vin V/s Vo).
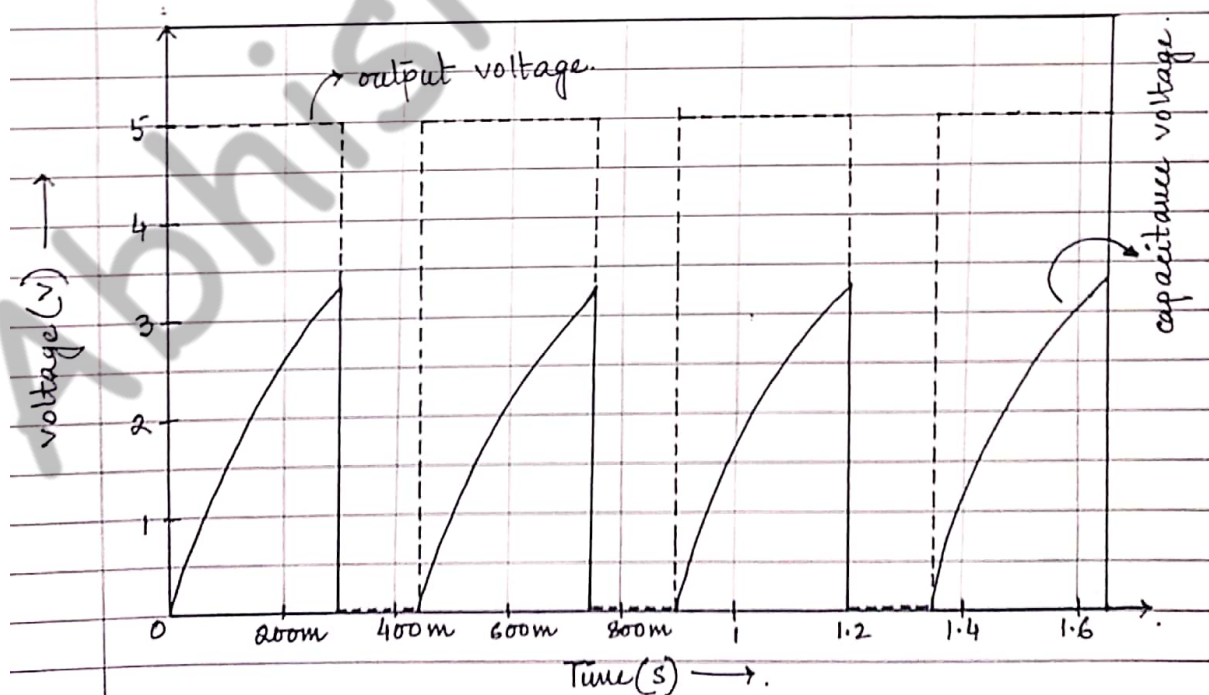
② Monostable Multivibrator using NE555 IC :-
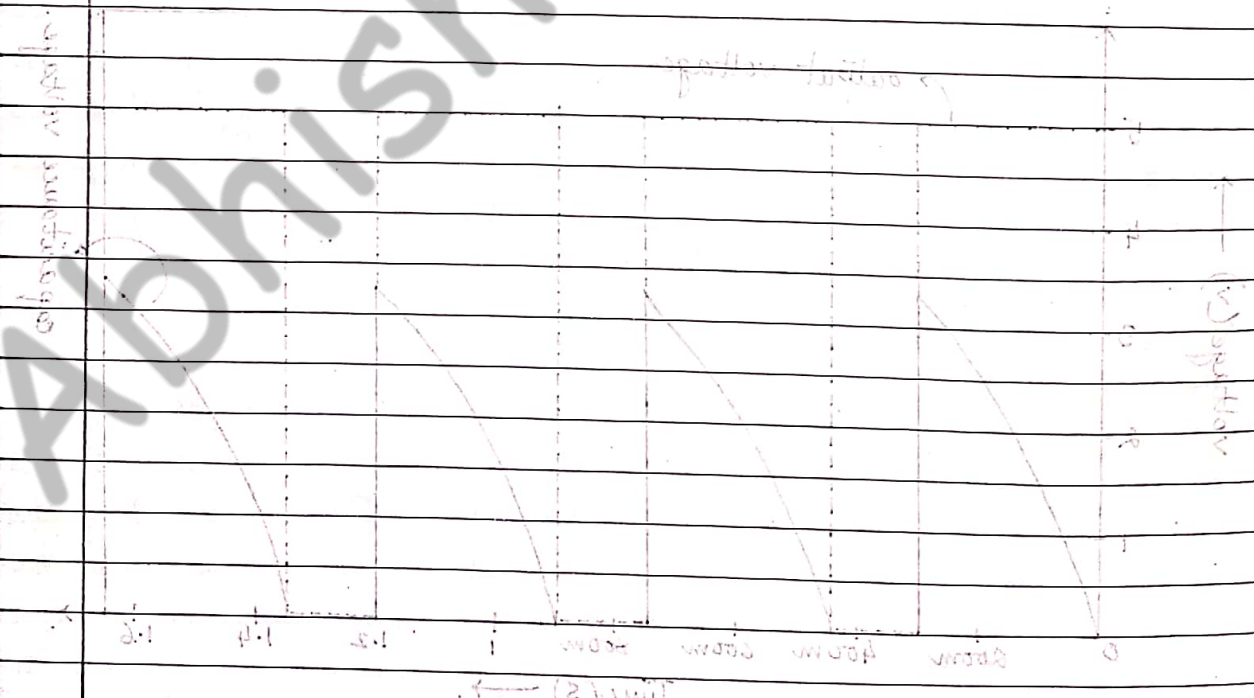

Fig : Monostable Multivibrator using NE555 IC graph (Vi V/s Vo).

Conclusion :- We have successfully deployed the timer circuit using the NE 555 and also have done the observation using the Astable and monostable multivibrator. The Astable and monostable multivibrator was successfully working and providing us the data related to the voltage from the capacitor and the output voltage. The graphs showed us the method of ON and OFF or switching of 0 and 1 by using the multivibrators. Hence we can conclude that, two circuits were deployed successfully and they are working properly.

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