Circuit Simulation Project

SQUARE WAVE GENERATOR USING LM741

Name of the participant: Tahanvi Yadav

Project Guide: Dr. Subhashini N

Name of Institution: Vellore Institute of Technology, Chennai

Title of the circuit: Square Wave generator using LM741

Theory/Description:

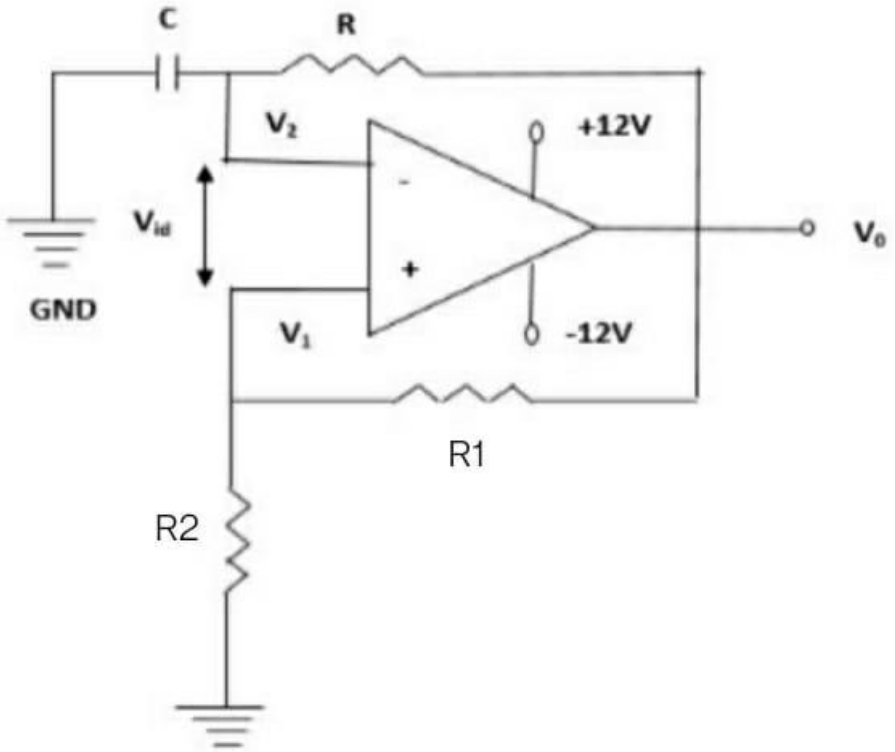
The **Op-amp Multivibrator** is an astable oscillator circuit that generates a rectangular output waveform using an RC timing network connected to the inverting input of the operational amplifier and a voltage divider network connected to the other non-inverting input.

Unlike the monostable or bistable, the astable multivibrator has two states, neither of which are stable as it is constantly switching between these two states with the time spent in each state controlled by the charging or discharging of the capacitor through a resistor.

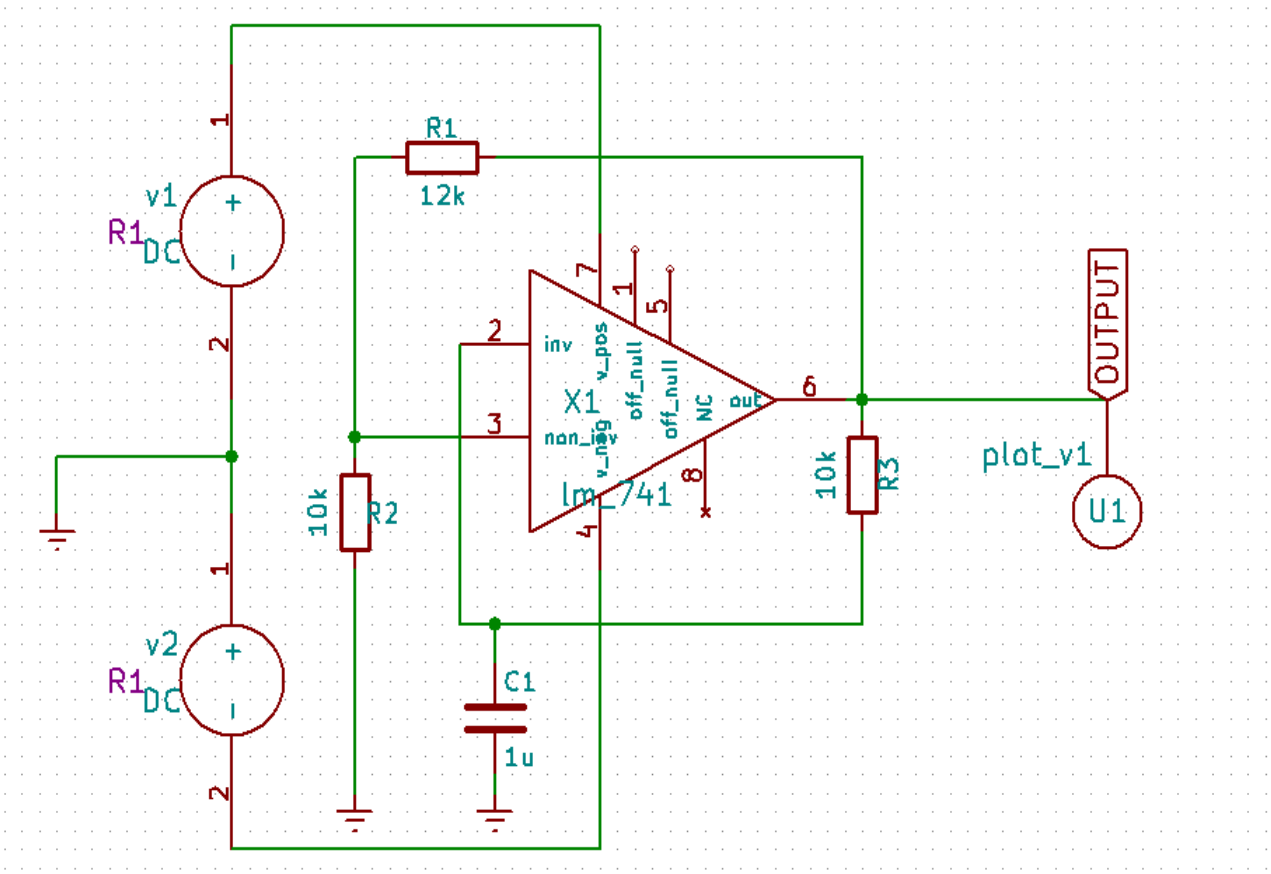
The Time period of the square wave is given by:

$$T=2RC \ln(1+Beta/1-Beta)$$

Where, $Beta=R_2/R_1+R_2$



Circuit Diagram:

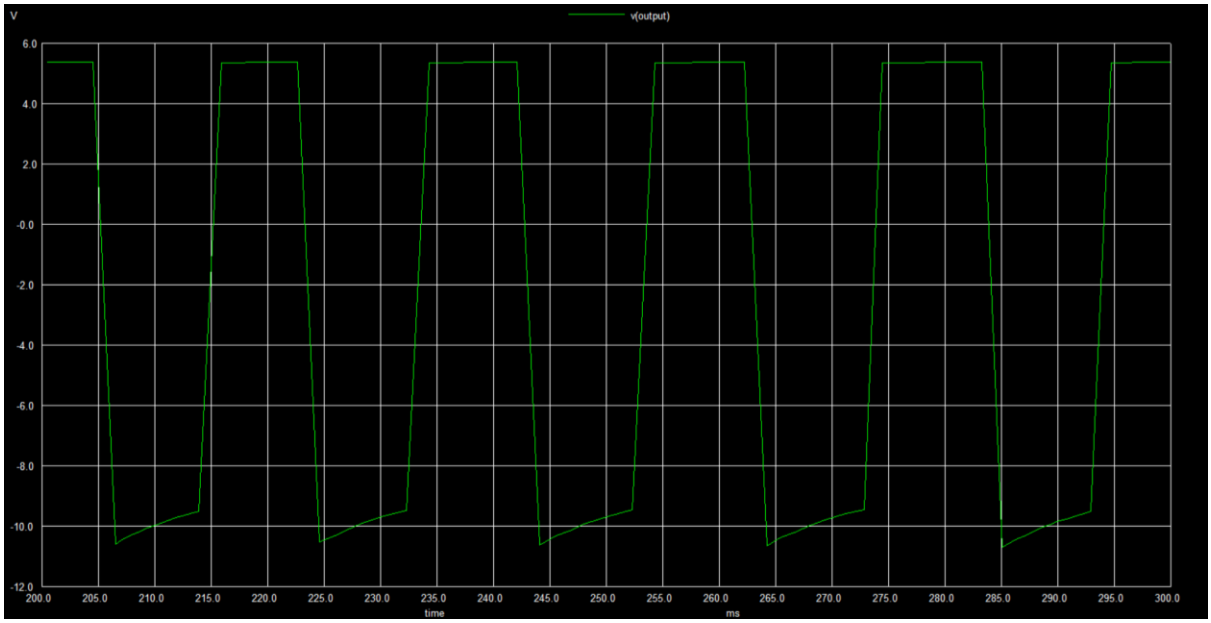


Results:

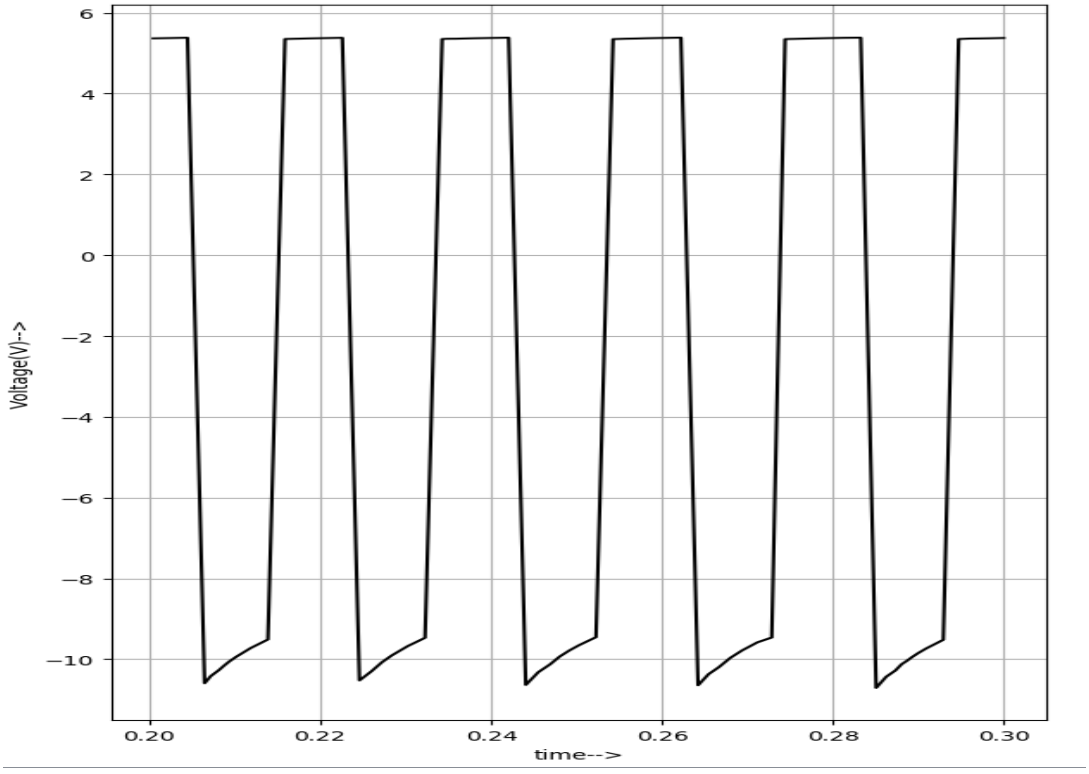
Beta=R_2/R_1+R_2 =10/22=0.4545

T=2RC ln(1+Beta/1-Beta) =0.0196 s = 19.6ms

OUTPUT WAVEFORM:



PYTHON PLOT:



Conclusion:

Hence, Square Wave generator using LM741 has been designed and simulated using eSim software.

Source/Reference(s):

https://www.watelectronics.com/square-wave-generator-circuit-using-op-amp/

https://www.elprocus.com/what-is-a-square-wave-generator-circuit-diagram/

https://how2electronics.com/square-wave-generator-circuit-op-amp-741/#Op-Amp_IC_LM741

https://www.electronics-tutorials.ws/opamp/op-amp-multivibrator.html