Circuit Simulation Project

NEGATIVE CLAMPER CIRCUIT USING LM741

Name of the participant: Ashita Banger

Project Guide: Dr. Subhashini N

Name of the Institution- Vellore Institute of Technology, Chennai

Title of the circuit: Negative Clamper circuit using LM741

Theory/Description:

A <u>clamper</u> is an electronic circuit that fixes either the positive or the negative peak excursions of a signal to a defined value by shifting its DC value.

The clamper does not restrict the peak-to-peak excursion of the signal; it moves the whole signal up or down so as to place the peaks at the reference level.

In clamper circuits a predetermined dc level is added to the output voltage. (or) The output is clamped to a desired dc level.

- ➢ If the clamped dc level is +ve, the clamper is **positive clamper.**

- ➢ If the clamped dc level is –ve, the clamper is **negative clamper.**


Time Constant

In general, the clamper circuit depends on a variation in the capacitor time constant. (τ=**RC)**

The time constant should be sufficient that the capacitor voltage does not discharge considerably throughout the non-conducting diode period.

One should select the values of capacitance and resistance so that the circuit keeps the time constant high. For preventing quick discharge of the capacitor, the resistance value should be high.

All through the diode conducting period, the capacitor charging should be high-speed. For this, we select a small value of capacitance.
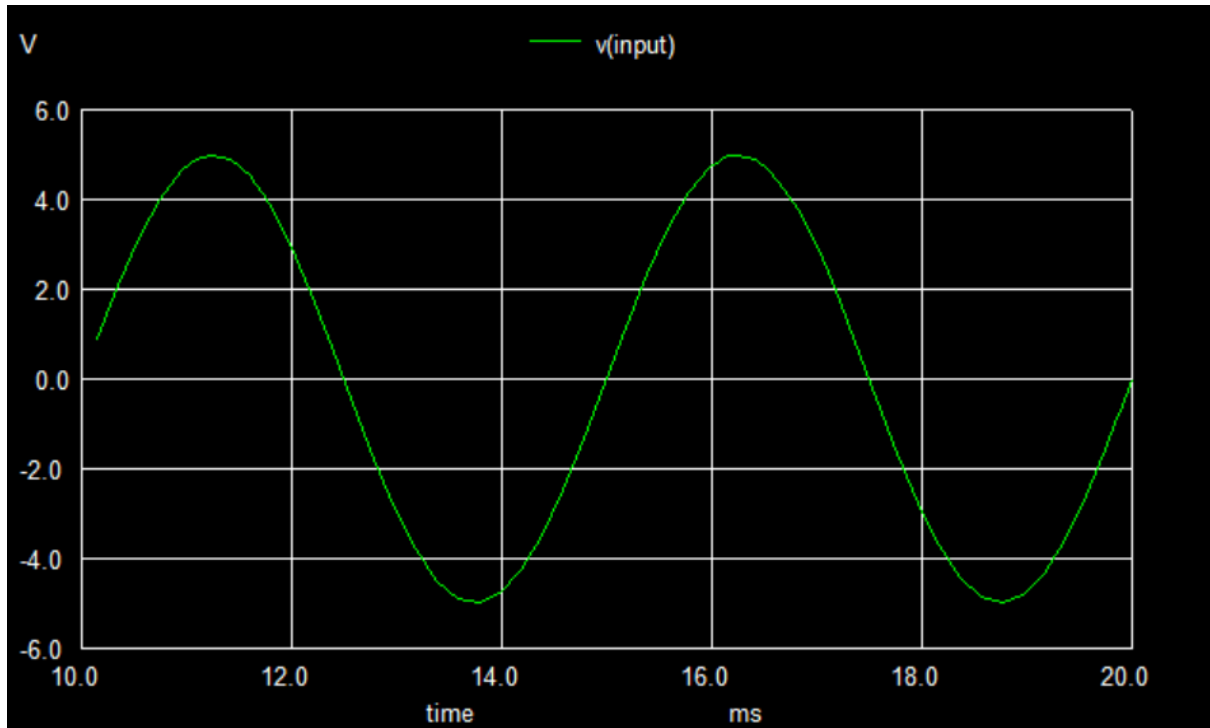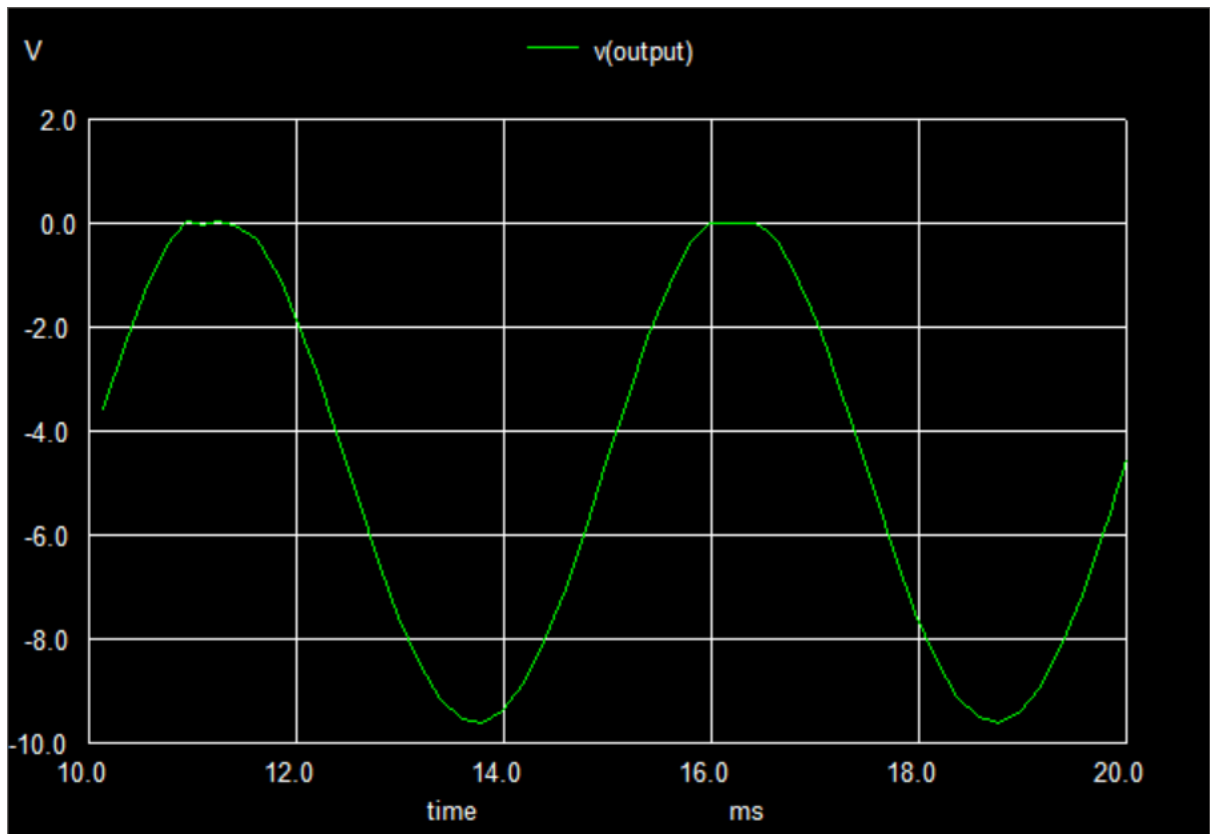
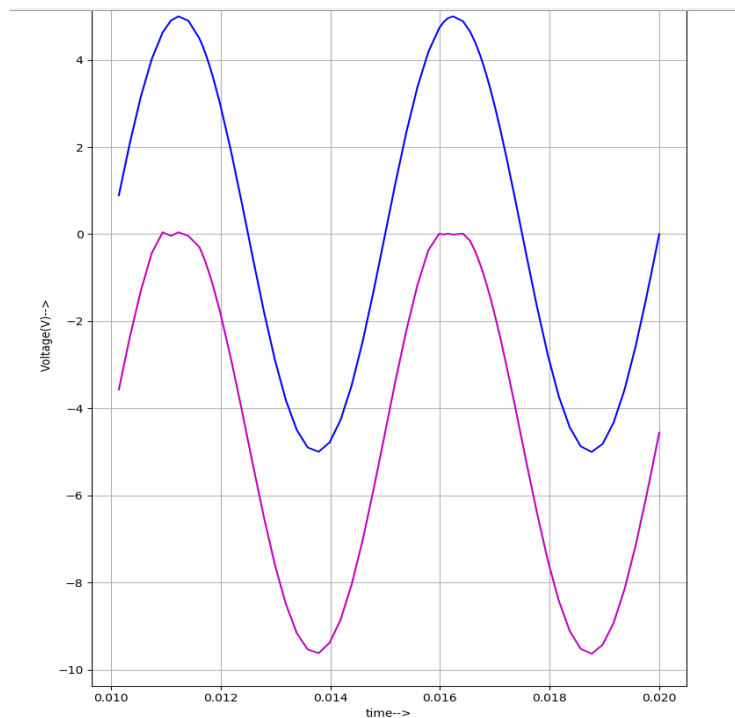**Negative Clamper circuit with zero reference voltage**
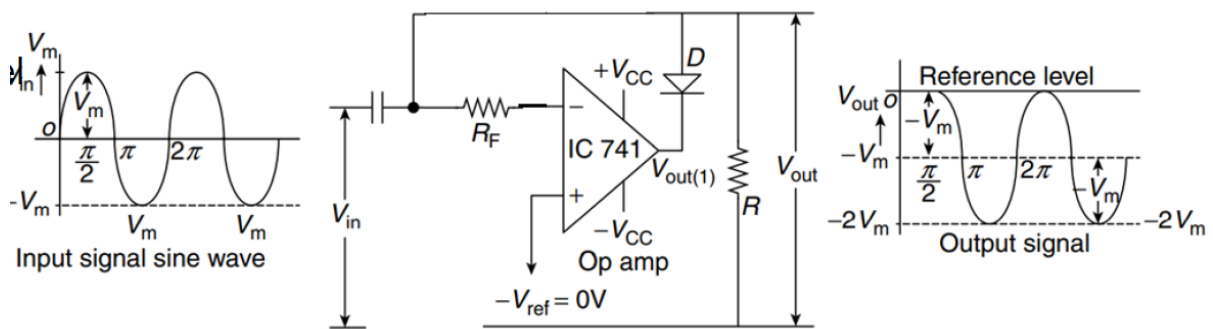
Circuit Diagram:
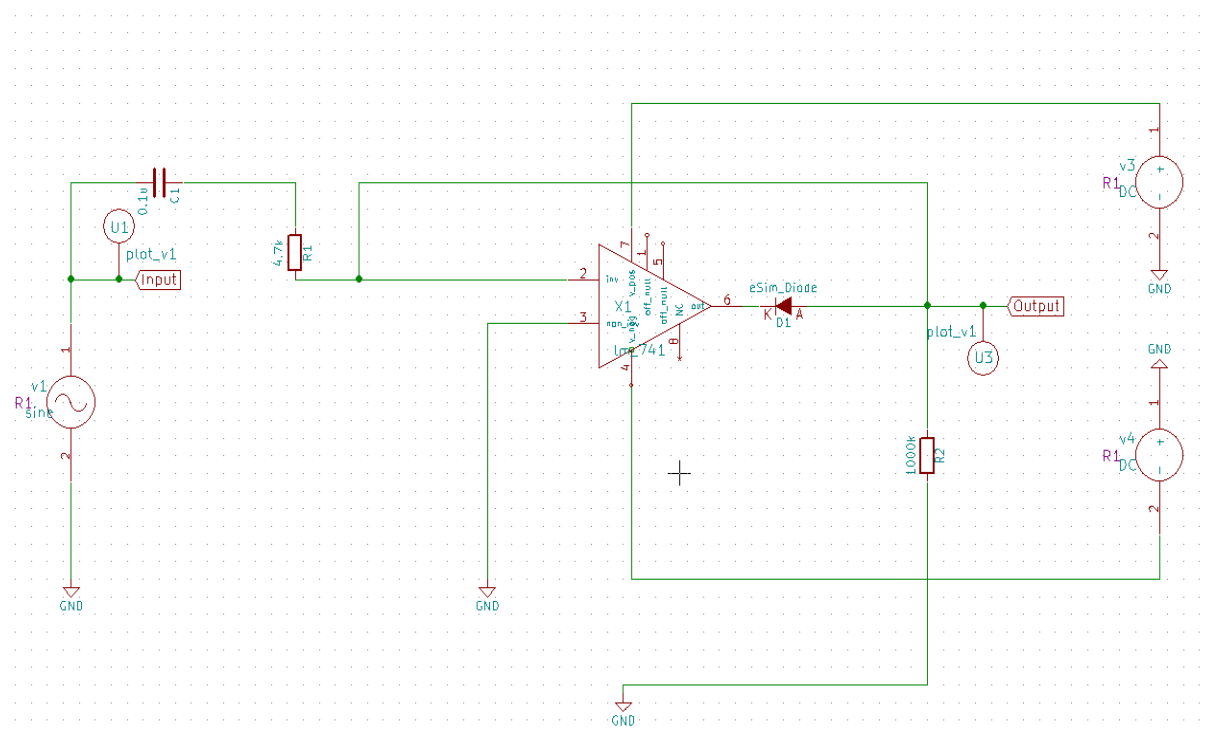
Input Waveform

Output Waveform

Python Plot

----- Output Voltage Plot

----Input Voltage Plot

Conclusion: Hence a negative clamper circuit using LM741 op- amp has been designed and simulated using eSim software.

References:

https://www.electrical4u.com/clamping-circuit/

https://www.wikiwand.com/en/Clamper_(electronics)

https://www.brainkart.com/article/Clipper-and-clipper-using-Operational-Amplifier_36014/

https://www.electronicshub.org/ic-741-op-amp-basics/