Title of the Experiment:

Analysis of Low Pass Filter using eSim.

Theory:

A low-pass lter is a lter that passes signals with a frequency lower than a certain cuto frequency and attenuates signals with frequencies higher than the cuto frequency. The amount of attenuation for each frequency depends on the lter design.

A simple passive RC Low Pass Filter or LPF, can be easily made by connecting together in series a single Resistor with a single Capacitor as shown below. In this type of lter arrangement the input signal (Vin) is applied to the series combination (both the Resistor and Capacitor together) but the output signal (Vout) is taken across the capacitor only.

Schematic Diagram:

The circuit schematic of Low pass lter register in eSim is as shown below:

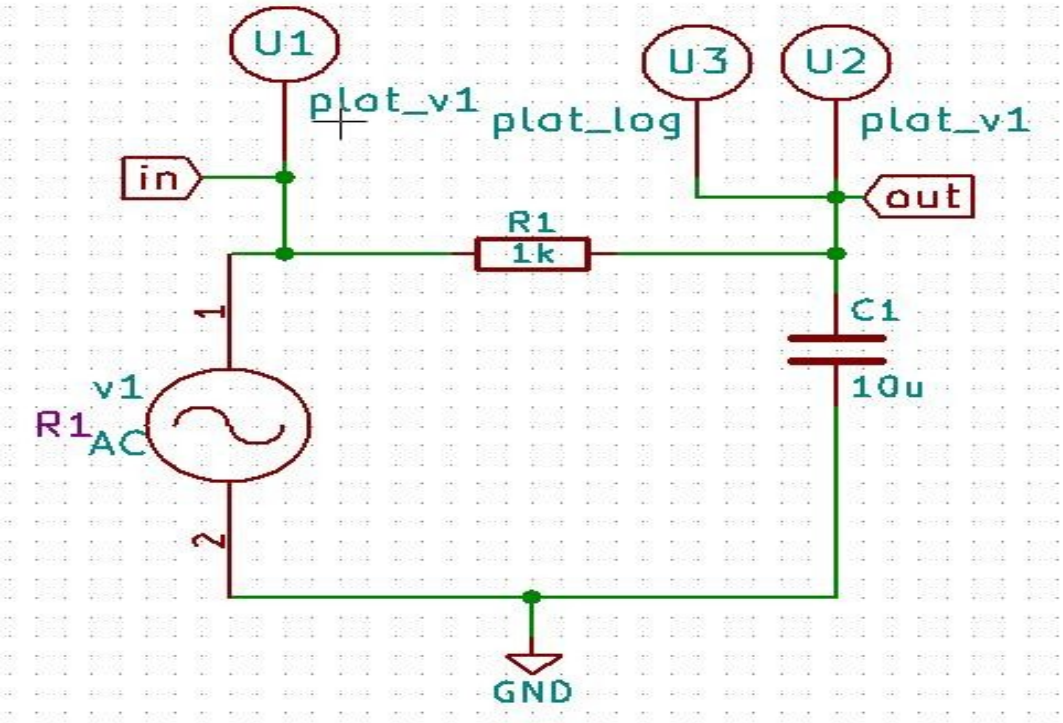

Fig 1. Low pass filter circuit

Simulation Results:

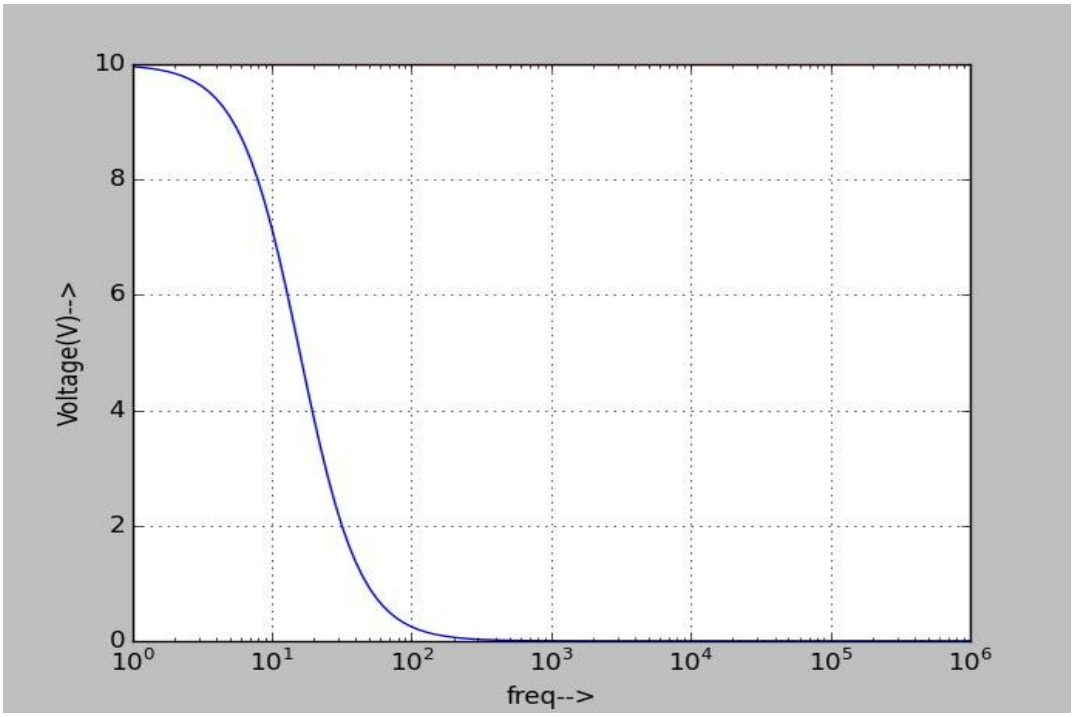

Fig 2. Python output plot

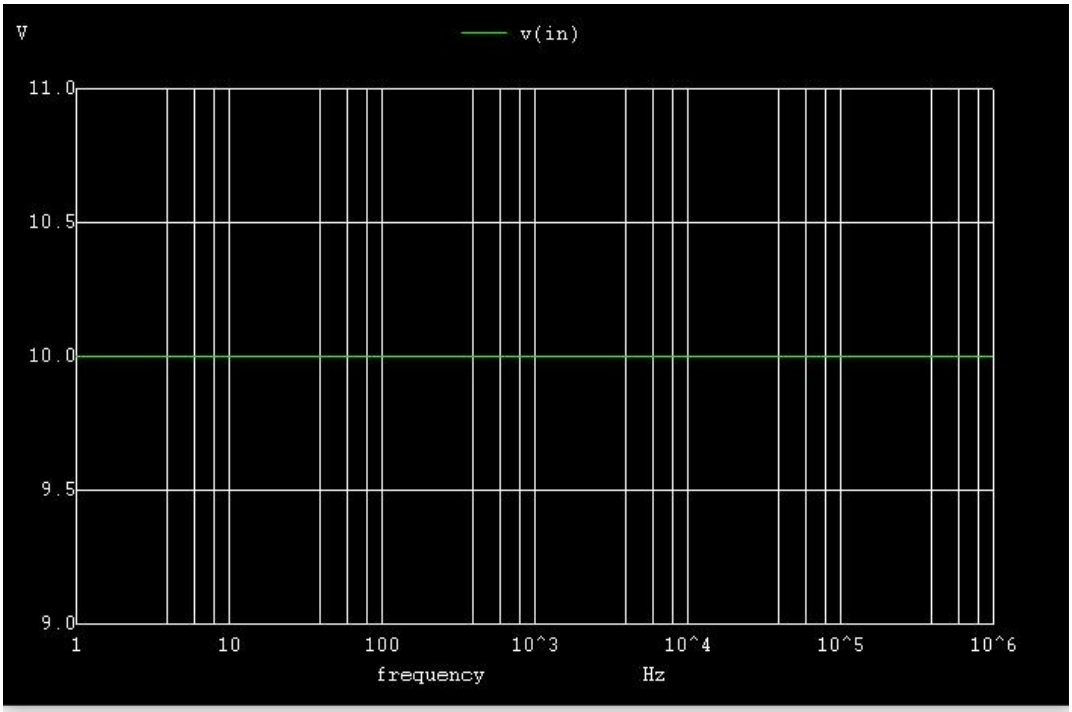

Fig 3. ngspice input plot(Vin)

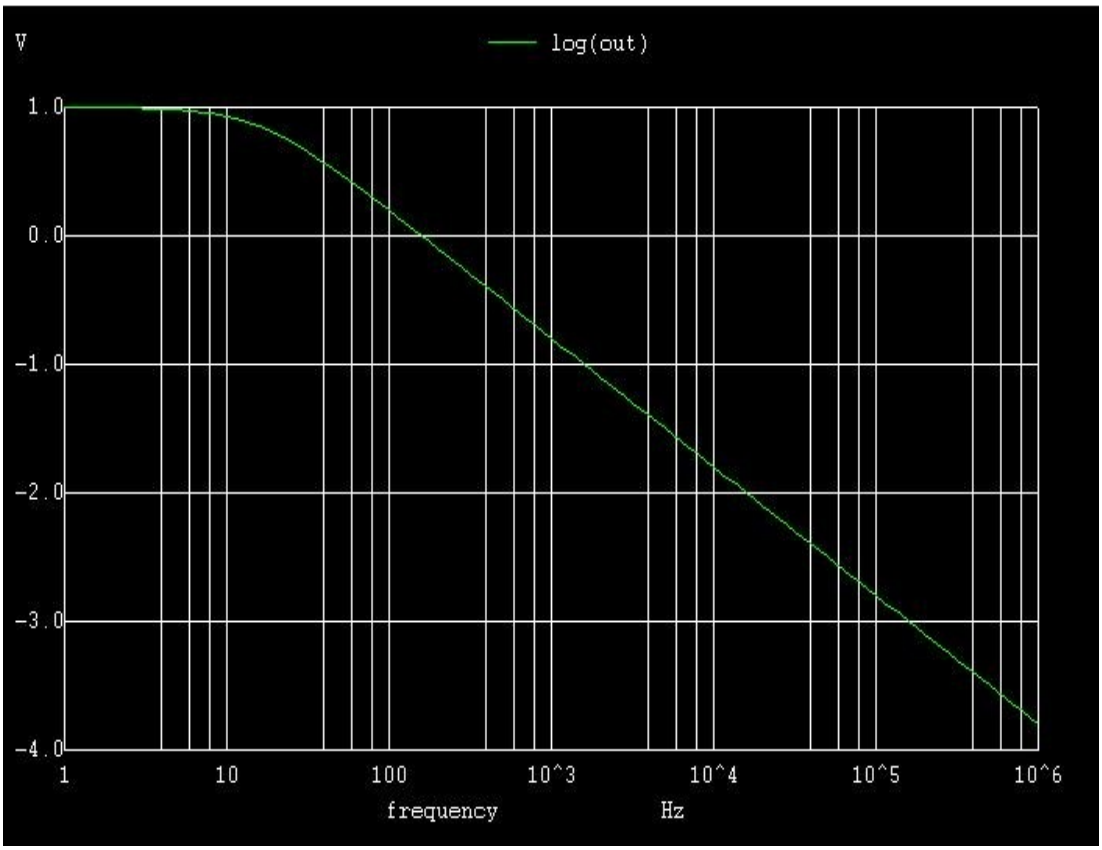

Fig 4. ngspice output plot(Vout)