Islamic University of Technology (IUT)
Organisation of Islamic Cooperation (OIC)
Department of Electrical and Electronic Engineering
Electronics Laboratory

Name: …… Student No…… Section and Group……

Course: EEE 4484 (Digital Electronics and Pulse Techniques Lab)
Experiment no.: 02

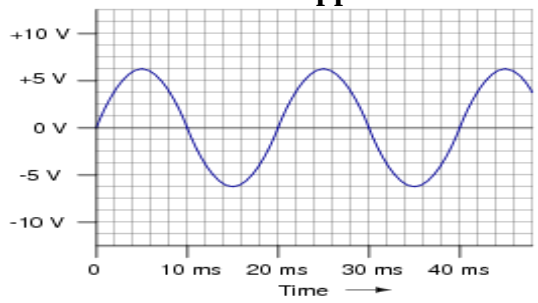
Name of the experiment: Study of wave shapes different types of clipping and clamping circuits using PSIM.

Part A: To construct the clipping circuits and observe its corresponding wave shapes.

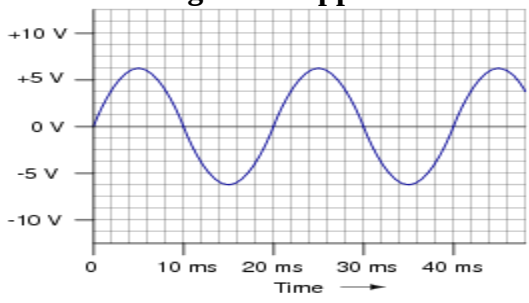
Clipper circuit have the ability to "clip" off a portion of the input signal without distorting the remaining part of the alternating waveform. The half-wave rectifier of is an example of the simplest form of diode clipper - one resistor and diode. Depending on the orientation of the diode, the positive or negative region of the input signal is "clipped" off. There are two general categories of clippers: *series* and *parallel*. The series configuration is defined as one where the diode is in series with the load, while the parallel variety has the diode in a branch parallel to the load.

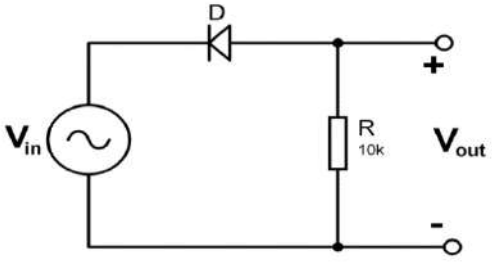
Series Clipper Circuit (with Diode and Resistor):

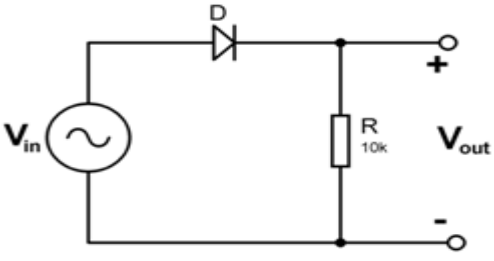
Positive Clipper



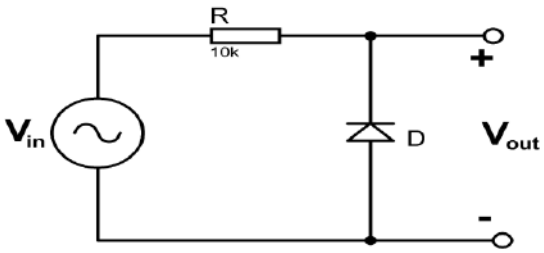
Negative Clipper

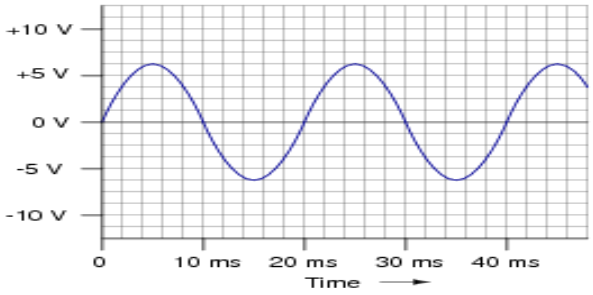






Parallel Clipper Circuit (with Diode and Resistor):

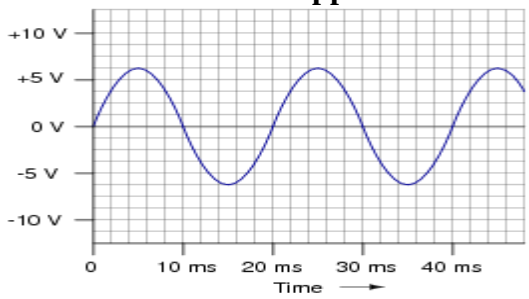


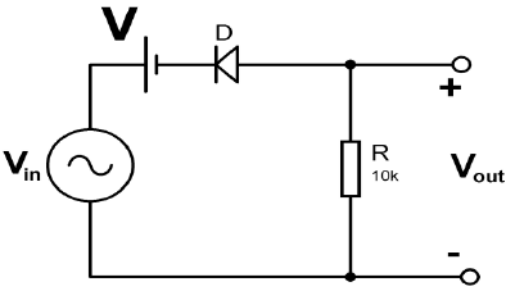


Biased Series Clipper Circuit (with Diode and Resistor):

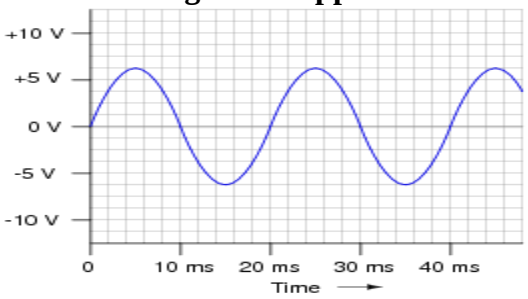
- Take DC voltage as 2V/ 3V

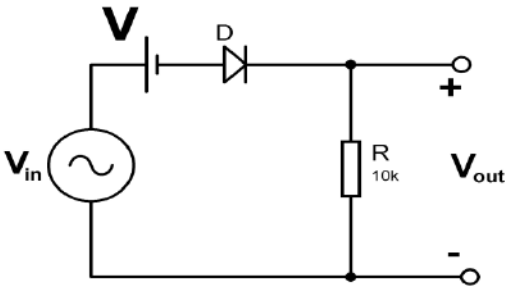
Positive Clipper





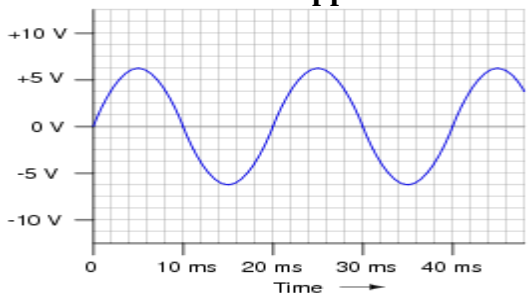
Negative Clipper



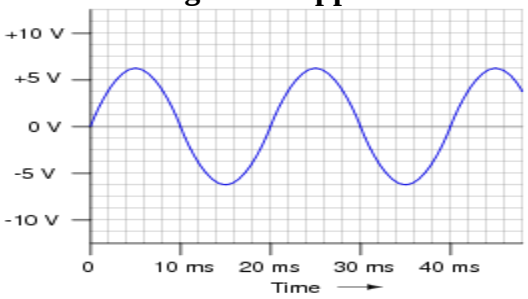


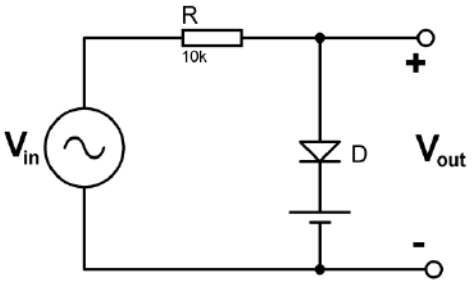
Biased Parallel Clipper Circuit (with Diode and Resistor):

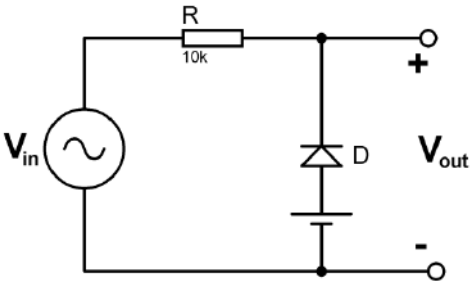
Positive Clipper



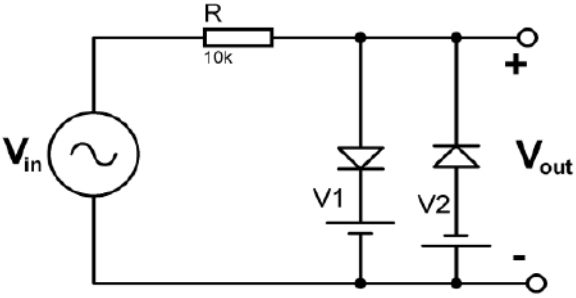
Negative Clipper

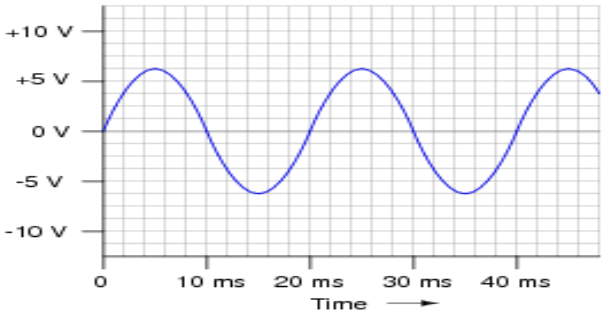






Combined





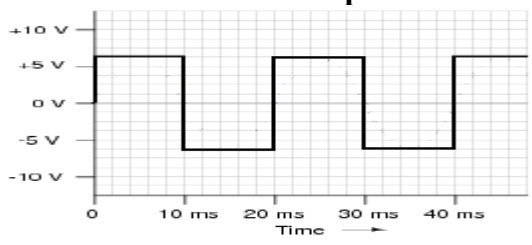
Part B: To construct the clamping circuits and observe its corresponding wave shapes.

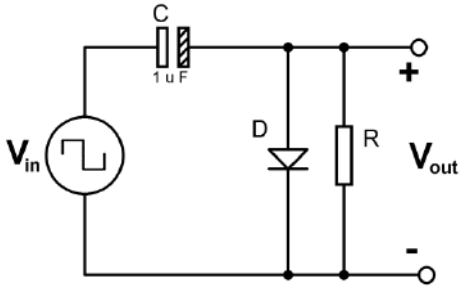
Clamping circuit will "clamp" a signal to a different dc level. The network must have a capacitor, a diode, and a resistive element, but it can also employ an independent dc supply to introduce an additional shift. The magnitude of *R* and *C* must be chosen such that the time constant *RC* is large enough to ensure that the voltage across the capacitor does not discharge significantly during the interval the diode is nonconducting.

Series clamping Circuit (with Diode and Resistor):

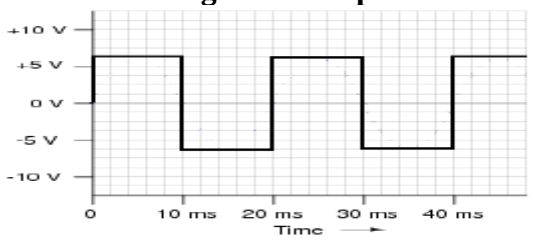
- Take DC voltage as 2V/ 3V and resistance as 1000k to observe the outputs properly.
- Take the DC offset of square wave as -5V and Peak to peak voltage as 10V.

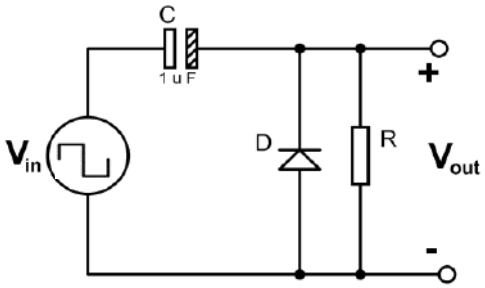
Positive clamper

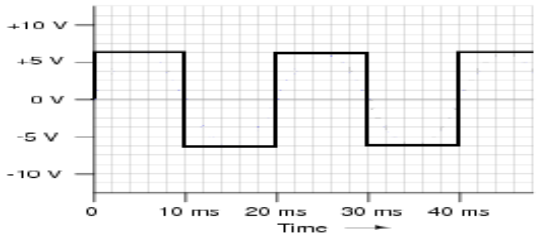


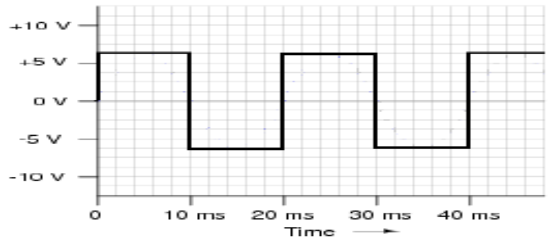


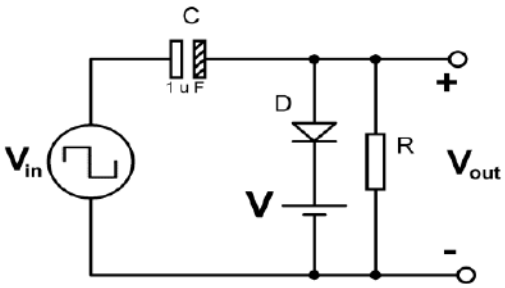
Negative clamper

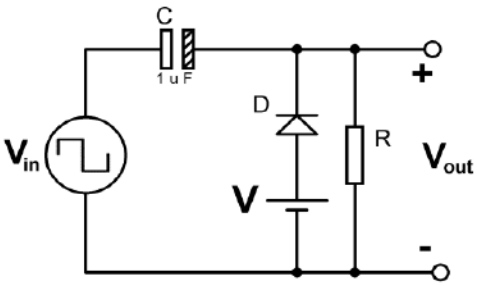








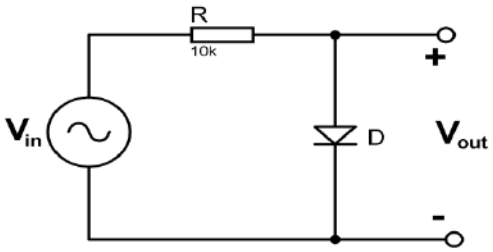




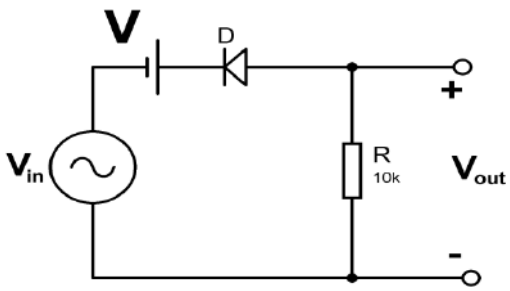
Assignments:

Construct the following circuits. Give suitable values for a sinusoidal input and observe the output voltage waveforms.

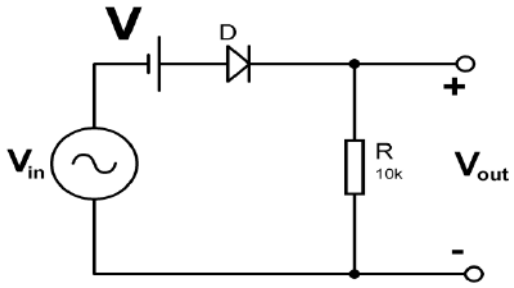
1.



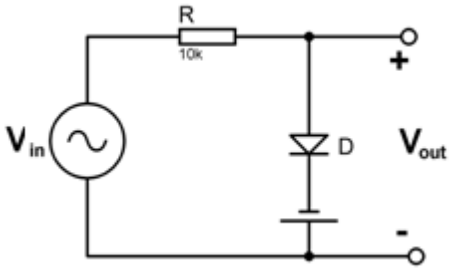
2.



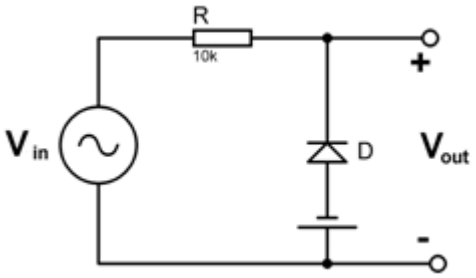
3.


V
D
+
V_{in}
R
10k
V_{out}
-

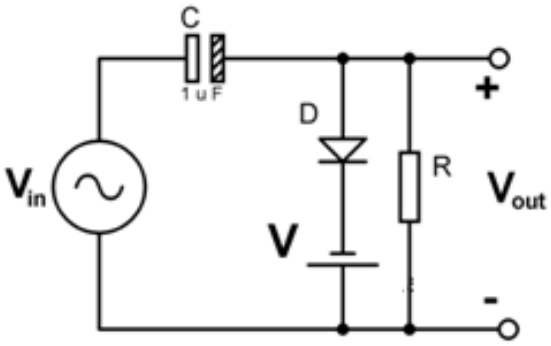
4.


R
10k
+
V_{in}
D
V_{out}
-

5.


R
10k
+
V_{in}
D
V_{out}
-

6.


C
1 u F
D
+
V_{in}
R
V_{out}
V
-

7.