## Clippers
## PRE LAB QUESTIONS

1. **What are the differences between linear and nonlinear wave shaping circuit?**

2. **What are the applications of wave shaping circuit?**

3. **What is wave shaping?**

4. **What is the necessity of wave shaping?**

5. **Mention the application of clipper and clamper.**

| **Experiment No. 8c)**<br>**Date :** | **CLIPPERS** |
|---|---|

**Aim**

To study the clipping circuits for different reference voltages and to verify the responses.

**Apparatus Required**

| S.No. | Name | Range | Qty |
|---|---|---|---|
| 1 | CRO | 1Hz-20MHz | 1 |
| 2 | RPS | (0–30) V | 1 |
| 3 | Bread Board | - | 1 |
| 4 | Connecting Wires | - | Req |
| 5 | Function Generator | 1Hz-1MHz | 1 |

**Components Required**

| S.No. | Name | Range | Qty |
|---|---|---|---|
| 1 | Resistor | 10KΩ | 1 |
| 2 | Diode | IN4007 | 1 |

**Theory**

The non-linear semiconductor diode in combination with resistor can function as clipper circuit. Energy storage circuit components are not required in the basic process of clipping. These circuits will select part of an arbitrary waveform which lies above or below some particular reference voltage level and that selected part of the waveform is used for transmission. So they are referred as voltage limiters, current limiters, amplitude selectors or slicers. There are three different types of clipping circuits.

1) Positive Clipping circuit.

2) Negative Clipping.

3) Positive and Negative Clipping (slicer).

In positive clipping circuit positive cycle of Sinusoidal signal is clipped and negative portion of sinusoidal signal is obtained in the output of reference voltage is added, instead of complete positive cycle that portion of the positive cycle which is above the reference

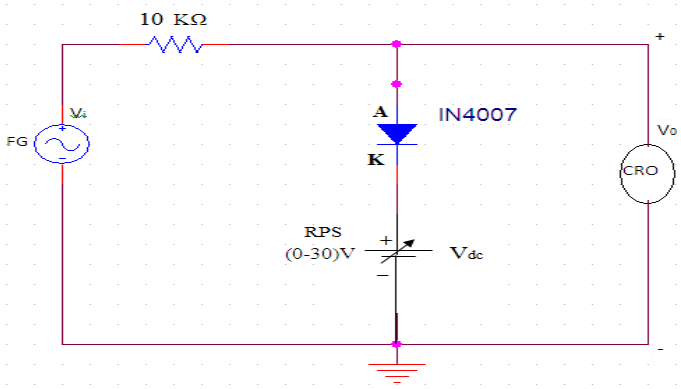
voltage value is clipped. In negative clipping circuit instead of positive portion of sinusoidal signal, negative portion is clipped. In slicer both positive and negative portions of the sinusoidal signal are clipped.

## Procedure

1. Connect the circuit as shown in the circuit diagram.
2. Connect the function generator at the input terminals and CRO at the output terminals of the circuit.
3. Apply a sine wave signal of frequency 1 KHz, Amplitude greater than the reference voltage at the input and observe the output waveforms of the circuits.

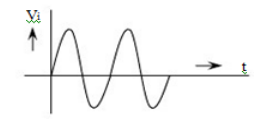
## Circuit Diagram

### Positive Clipper

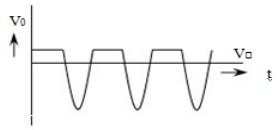



**Model Graph:**

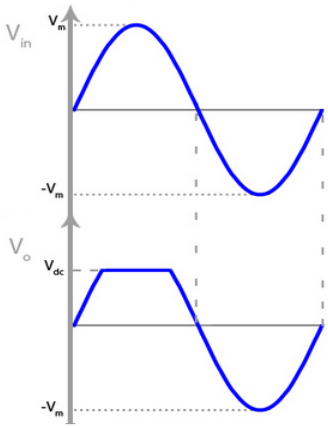
**Input waveform**



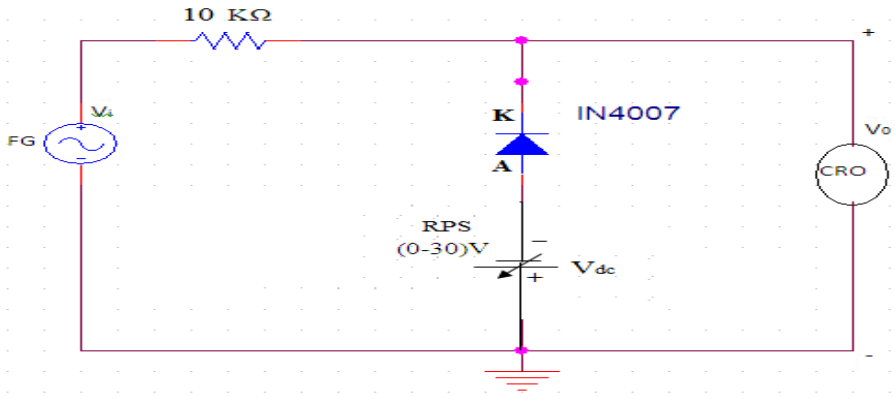
**Unbiased Clipper Output Waveform**

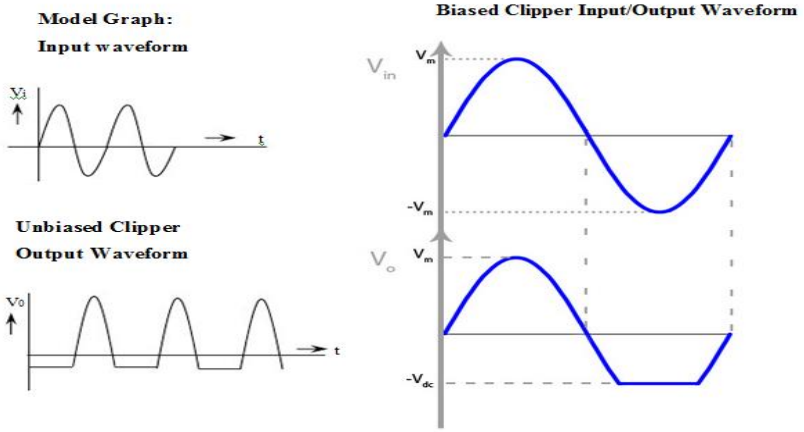


**Biased Clipper Input Output Waveform**



## Negative Clipper



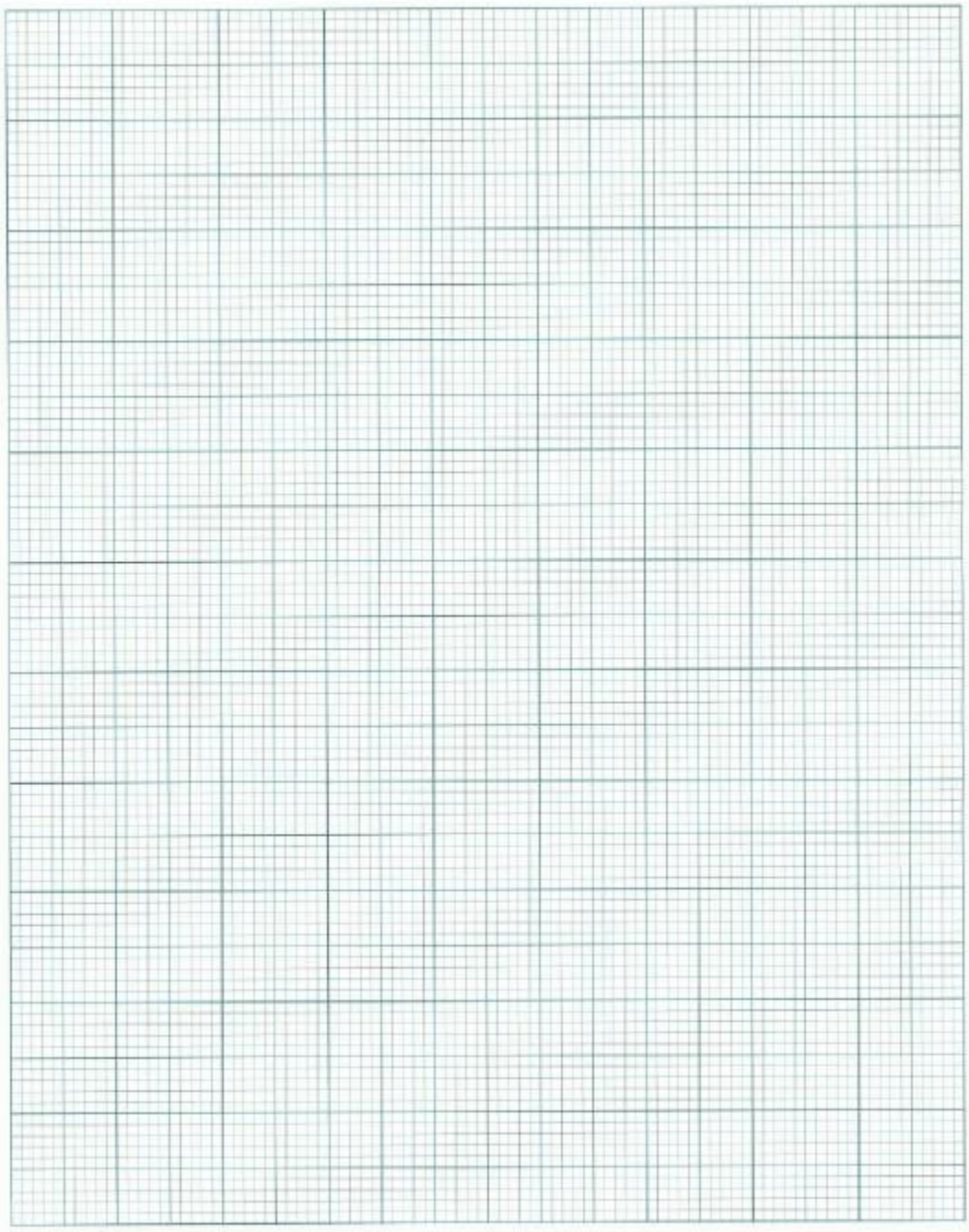




**Tabulation:**

**Positive Clipper** **Negative Clipper**

| Unbiased Clipper | | | |
|---|---|---|---|
| $V_{ref}$ = 0V | | $V_{ref}$ = 0V | |
| Output voltage (V) | Time Period (ms) | Output voltage (V) | Time Period (ms) |
| | | | |
| Biased Clipper | | | |
| $V_{ref}$ = 2V | | $V_{ref}$ = 2 V | |
| Output voltage (V) | Time Period (ms) | Output voltage (V) | Time Period (ms) |
| | | | |

**GRAPH:**



**Result**

## POST LAB QUESTIONS

**1. Differentiate +ve and -ve Clippers.**

**2. What is the function of Clampers?**

**3. Write the classifications of clippers and clampers.**

**4. Draw the output for the given input to the clamper circuit**

**5. What is the need of wave shaping circuit?**