



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

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Department of Biomedical Engineering

Course Name: 23BMB101-Electron Devices and Circuits

I Year : II Semester

Unit I –Semiconductor Diodes

Topic : Clipper & Clamper



INTRODUCTION



- A Clipper circuit is a circuit that rejects the part of the input wave specified while allowing the remaining portion.
- The portion of the wave above or below the cut off voltage determined is clipped off or cut off.
- The clipping circuits consist of linear and non-linear elements like resistors and diodes but not energy storage elements like capacitors.
- The main advantage of clipping circuits is to eliminate the unwanted noise present in the amplitudes.
- Among the Diode Clippers, the two main types are positive and negative clippers

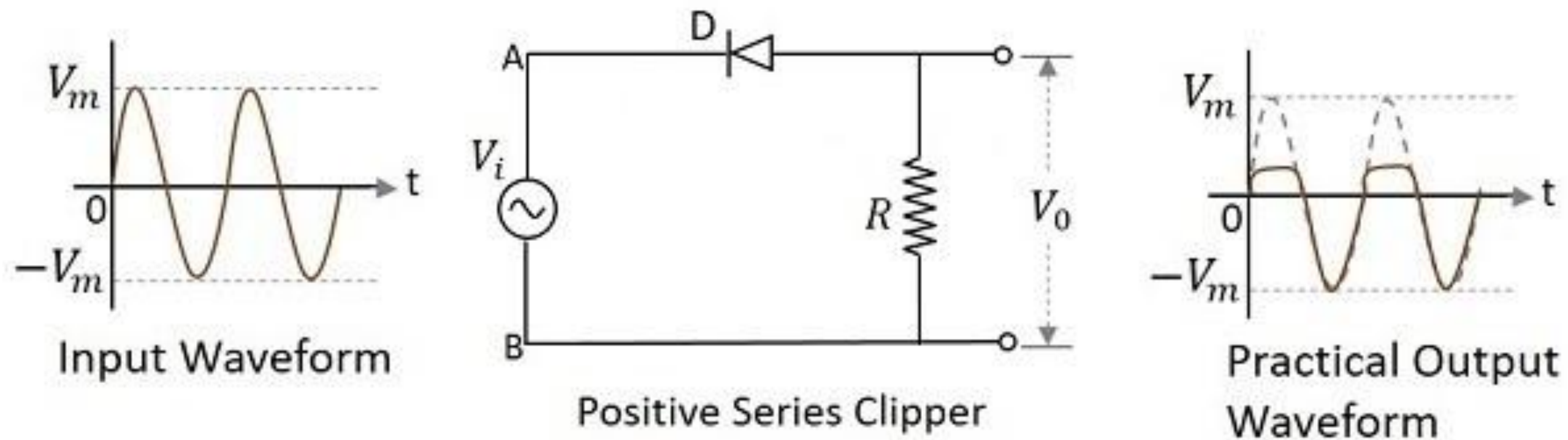


Positive Series Clipper

- A Clipper circuit in which the diode is connected in series to the input signal and that attenuates the positive portions of the waveform, is termed as **Positive Series Clipper**.

Vision Tit 2

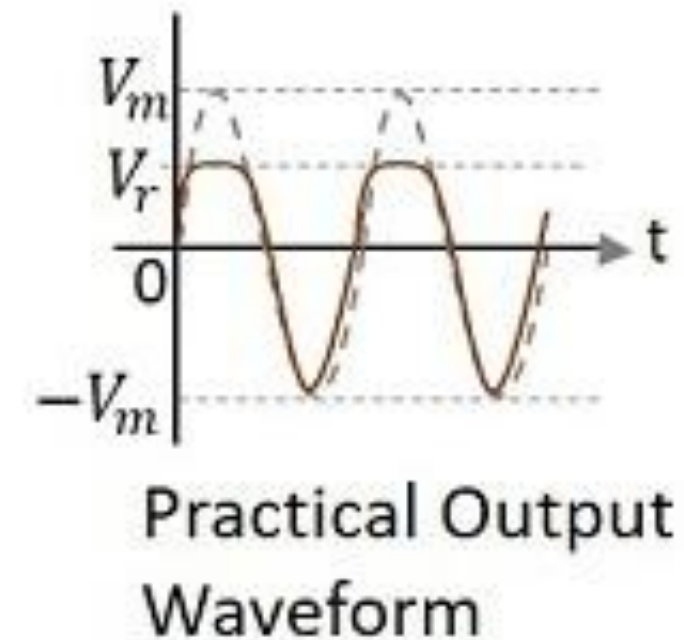
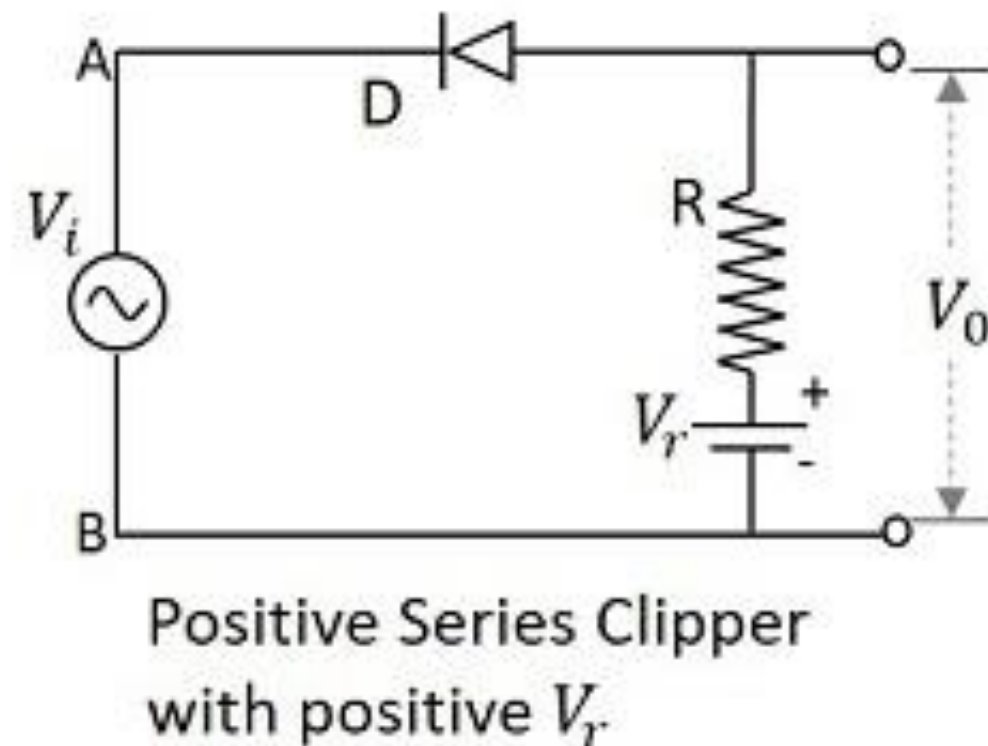
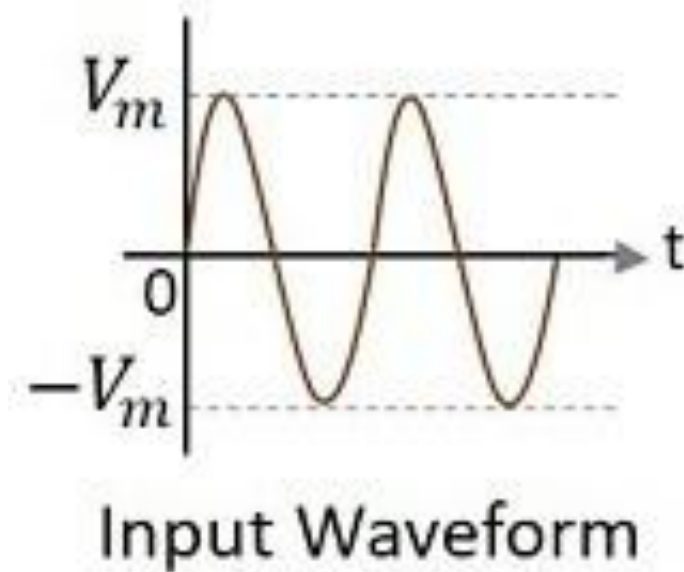
Vision Title 3





Positive Series Clipper with positive- V_r

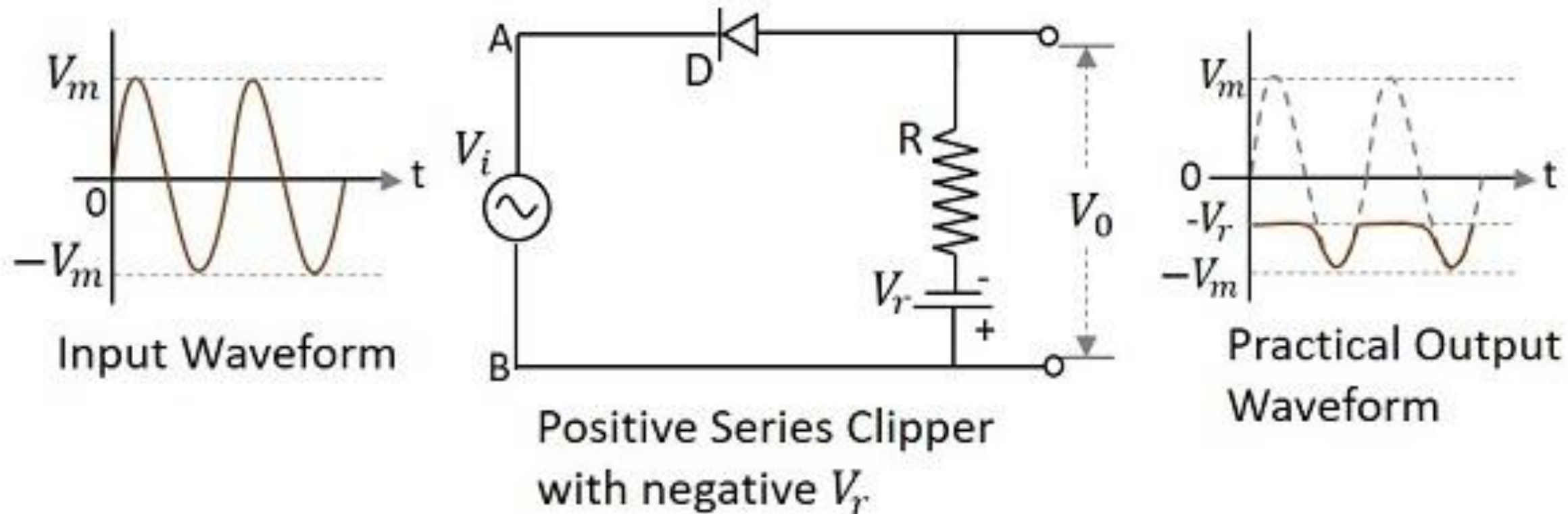
A Clipper circuit in which the diode is connected in series to the input signal and biased with positive reference voltage V_r and that attenuates the positive portions of the waveform, is termed as Positive Series Clipper with positive V_r





Positive Series Clipper with negative- V_r

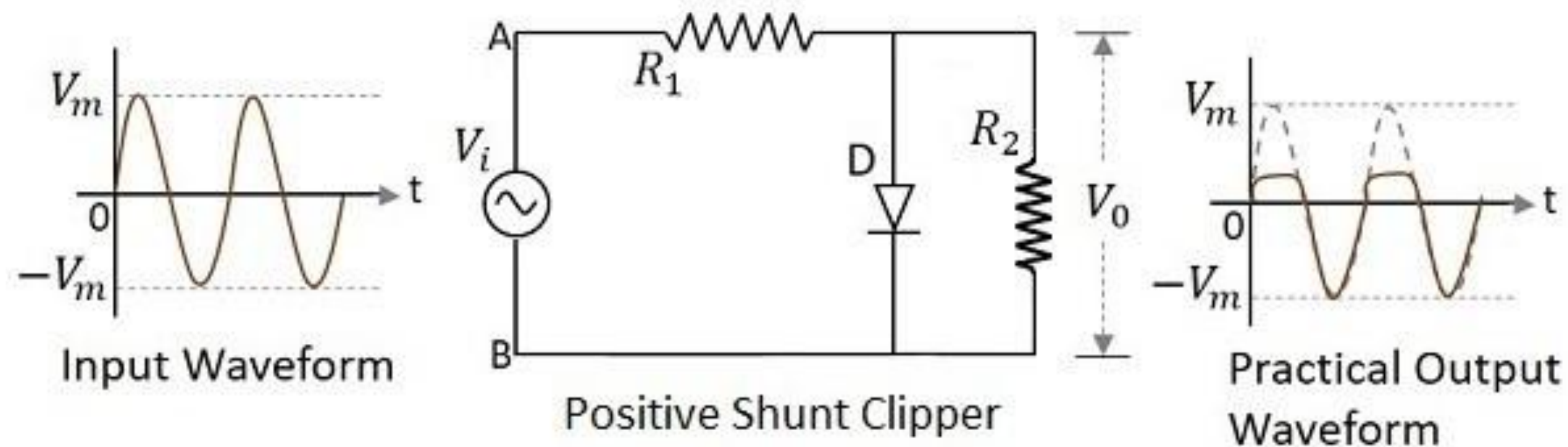
- A Clipper circuit in which the diode is connected in series to the input signal and biased with negative reference voltage V_r and that attenuates the positive portions of the waveform, is termed as Positive Series Clipper with negative V_r .





Positive Shunt Clipper

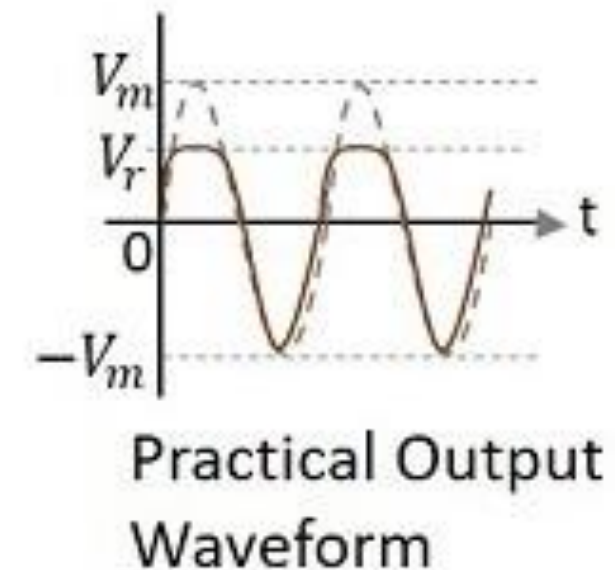
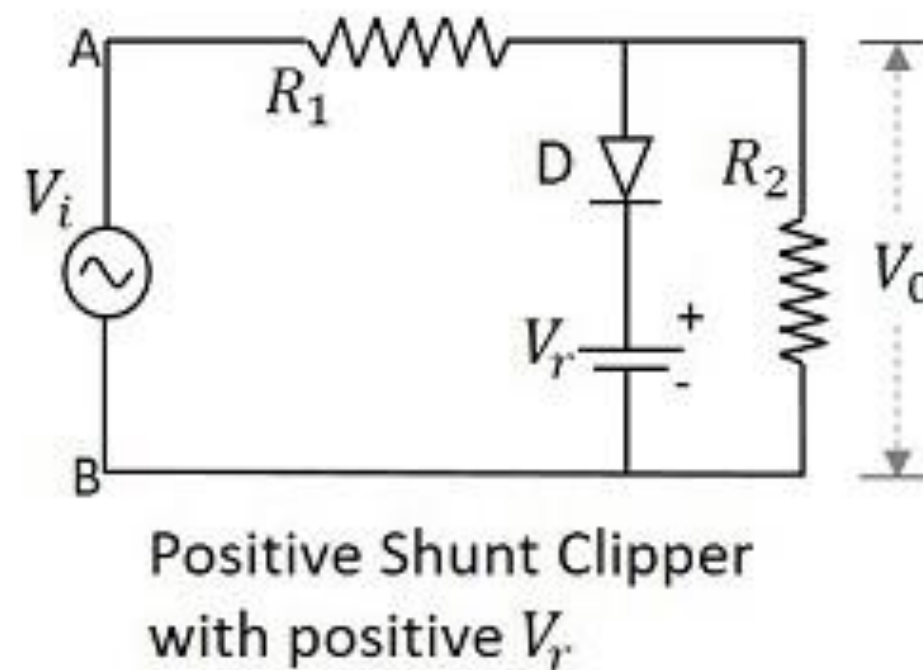
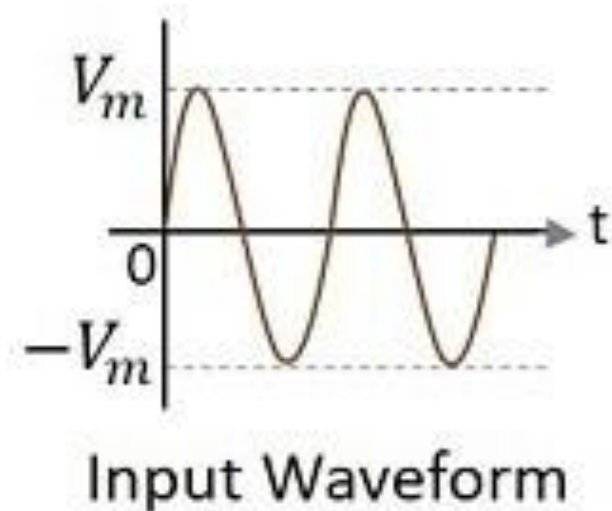
- A Clipper circuit in which the diode is connected in shunt to the input signal and that attenuates the positive portions of the waveform, is termed as **Positive Shunt Clipper**.





Positive Shunt Clipper with positive- V_r

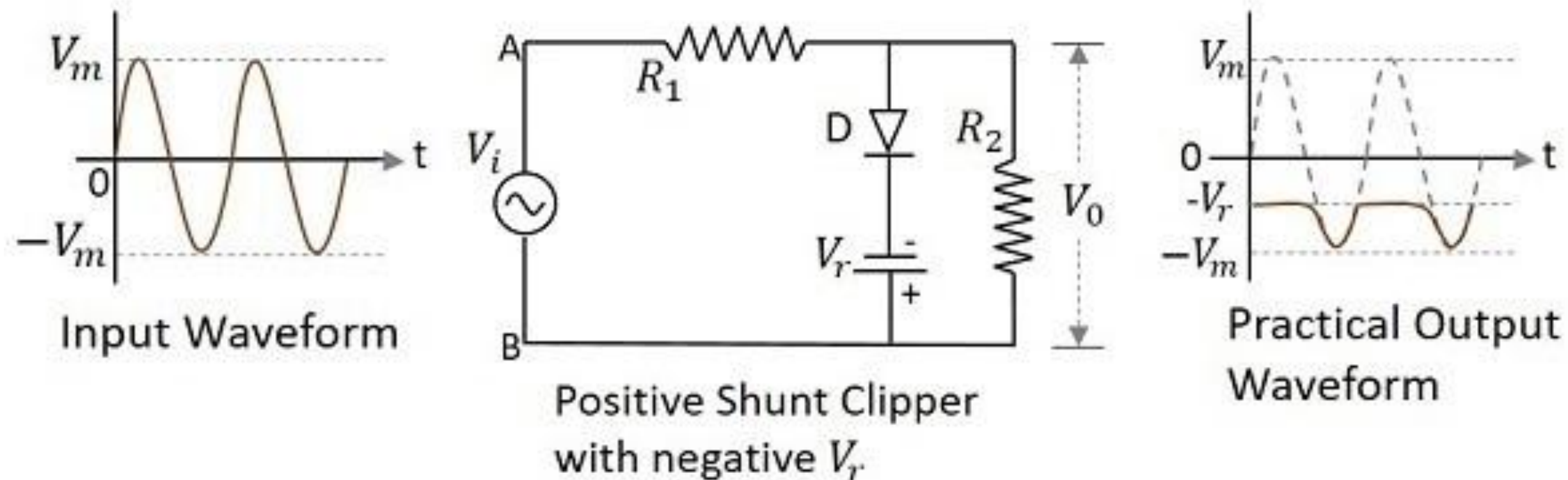
- A Clipper circuit in which the diode is connected in shunt to the input signal and biased with positive reference voltage V_r and that attenuates the positive portions of the waveform, is termed as Positive Shunt Clipper with positive V_r .





Positive Shunt Clipper with negative- V_r

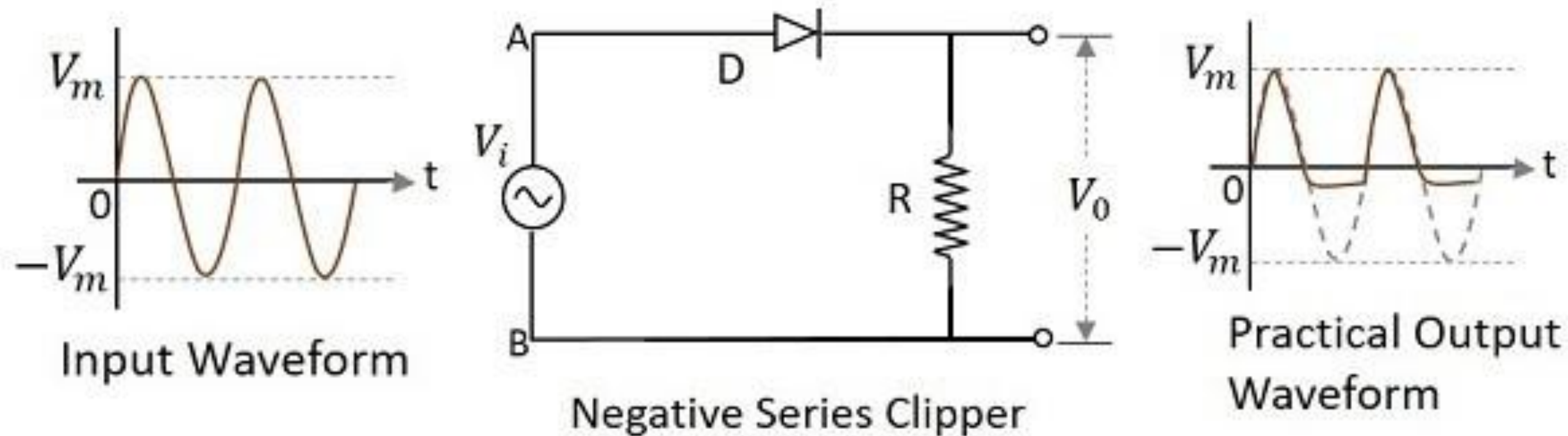
- A Clipper circuit in which the diode is connected in shunt to the input signal and biased with negative reference voltage V_r and that attenuates the positive portions of the waveform, is termed as Positive Shunt Clipper with negative V_r .





Negative Series Clipper

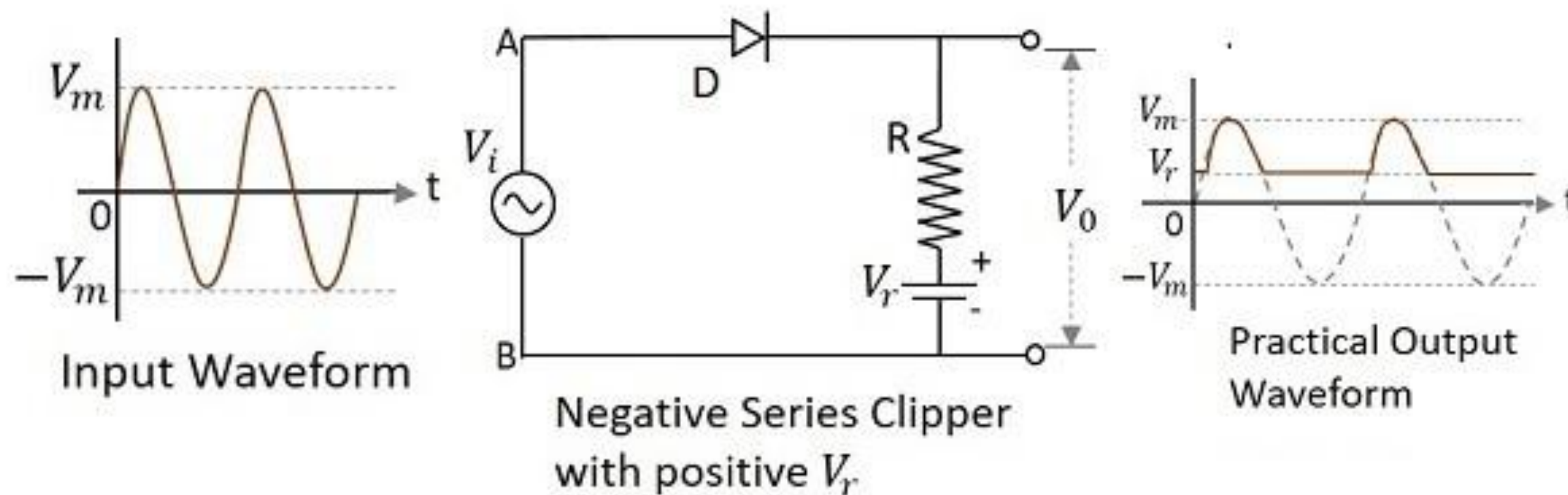
- A Clipper circuit in which the diode is connected in series to the input signal and that attenuates the negative portions of the waveform, is termed as **Negative Series Clipper**.





Negative Series Clipper with positive- V_r

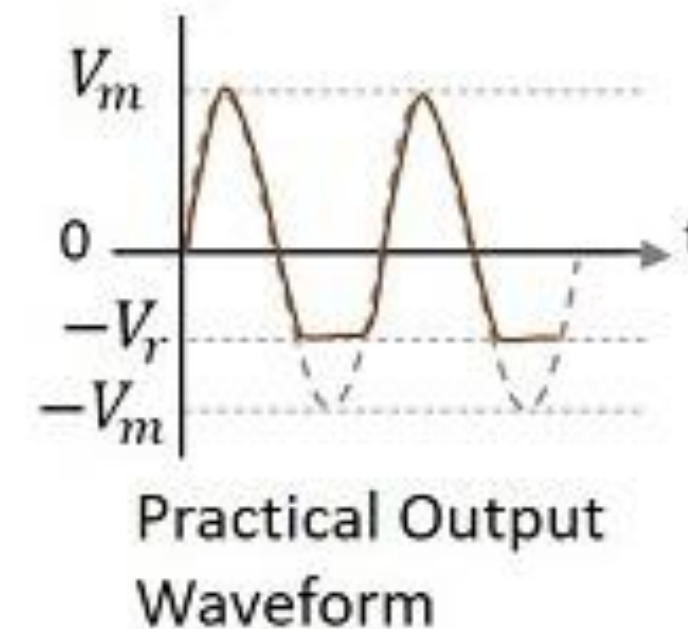
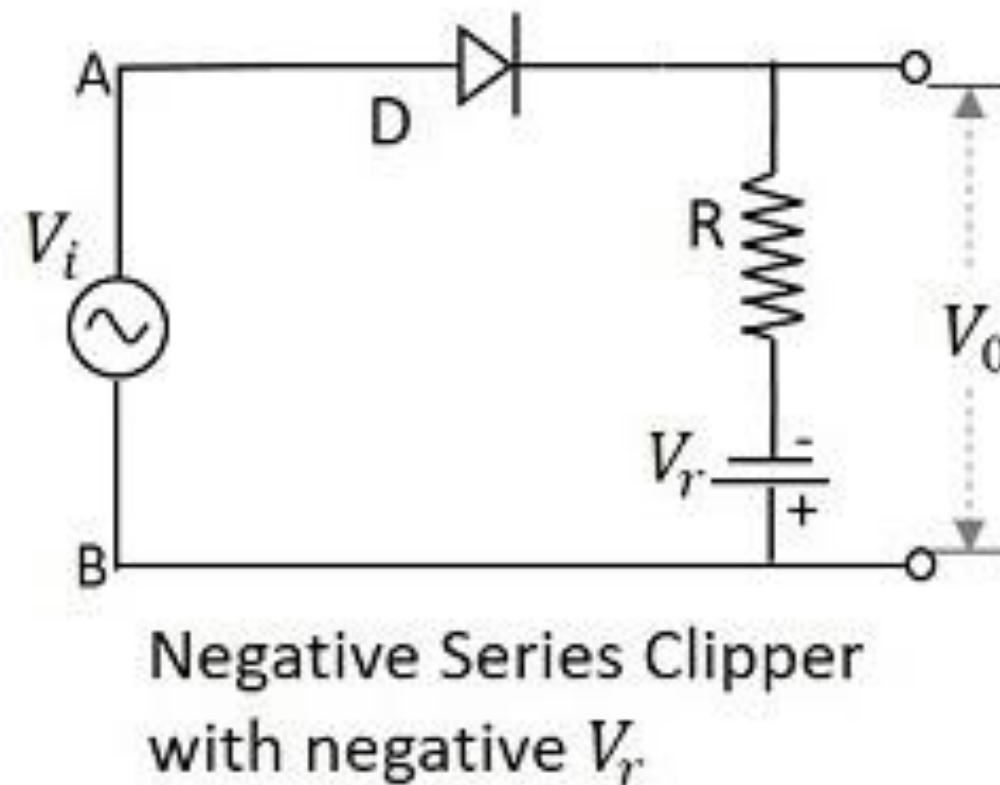
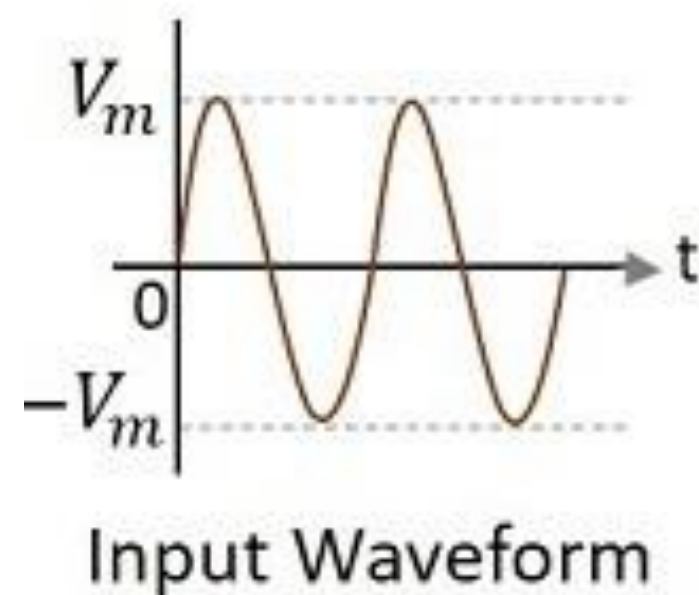
- A Clipper circuit in which the diode is connected in series to the input signal and biased with positive reference voltage V_r and that attenuates the negative portions of the waveform, is termed as Negative Series Clipper with positive, V_r .





Negative Series Clipper with negative- V_r

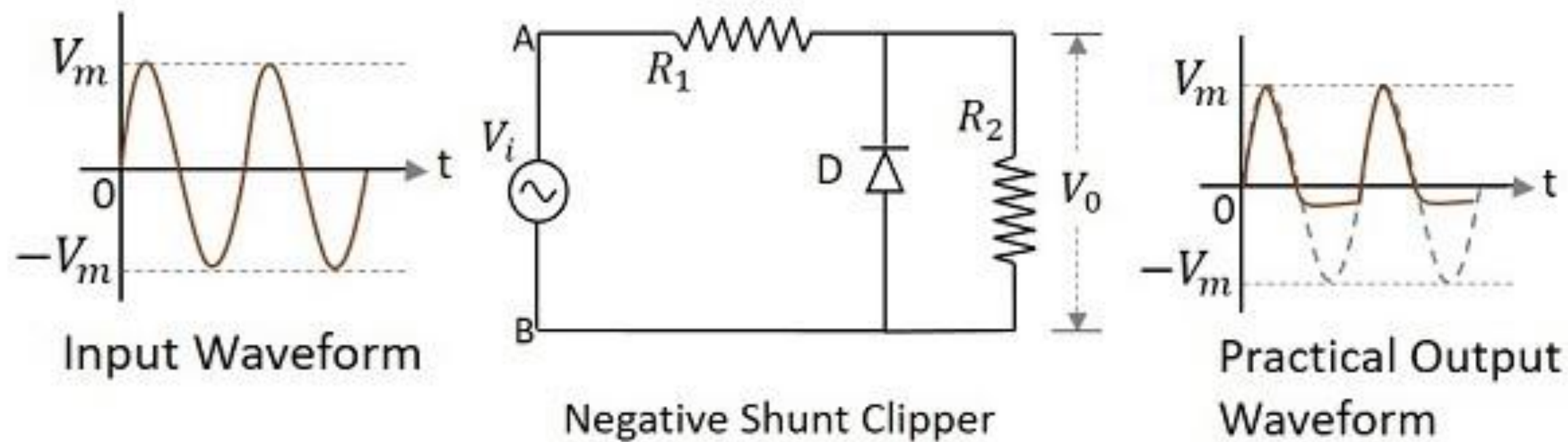
- A Clipper circuit in which the diode is connected in series to the input signal and biased with negative reference voltage V_r and that attenuates the negative portions of the waveform, is termed as Negative Series Clipper with negative V_r .





Negative Shunt Clipper

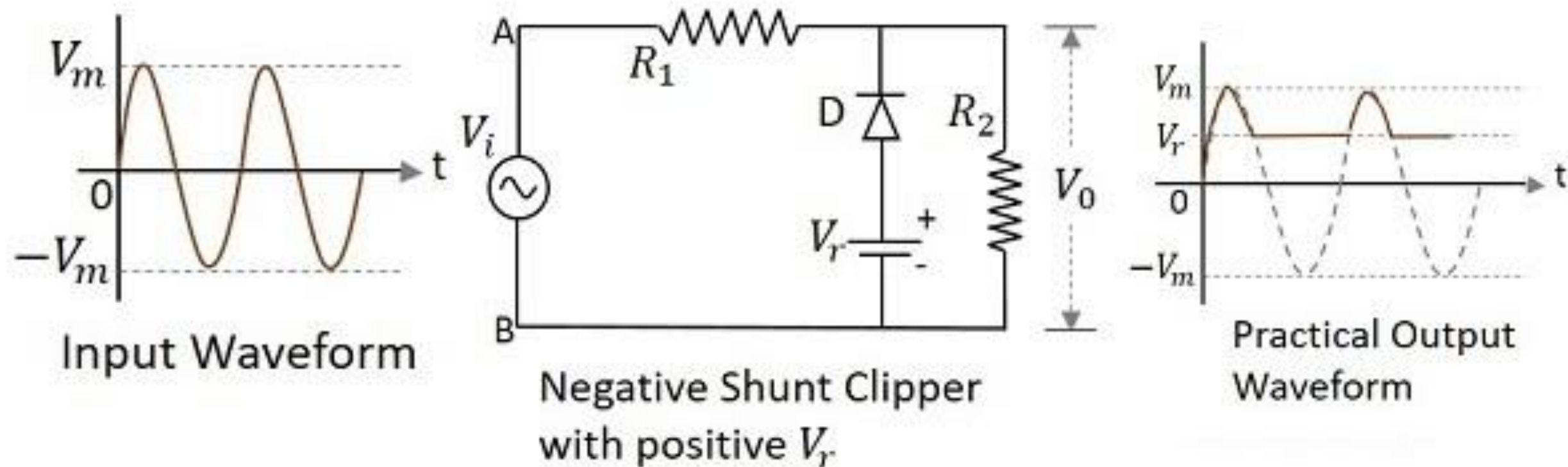
- A Clipper circuit in which the diode is connected in shunt to the input signal and that attenuates the negative portions of the waveform, is termed as **Negative Shunt Clipper**.





Negative Shunt Clipper with positive- V_r

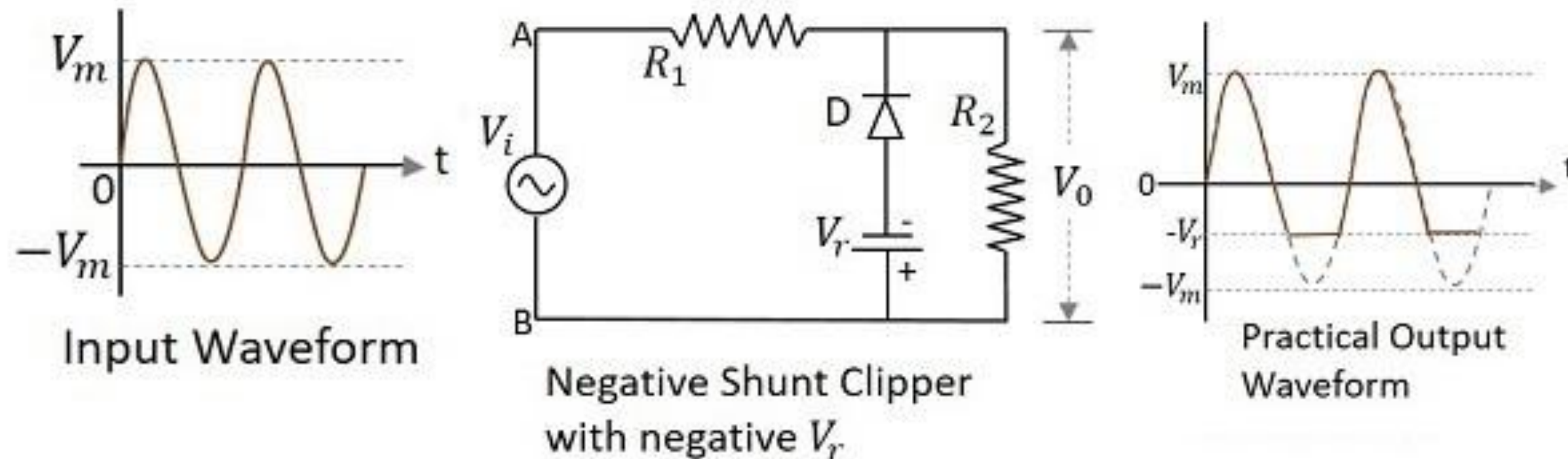
- A Clipper circuit in which the diode is connected in shunt to the input signal and biased with positive reference voltage V_r and that attenuates the negative portions of the waveform, is termed as Negative Shunt Clipper with positive V_r .





Negative Shunt Clipper with negative- V_r

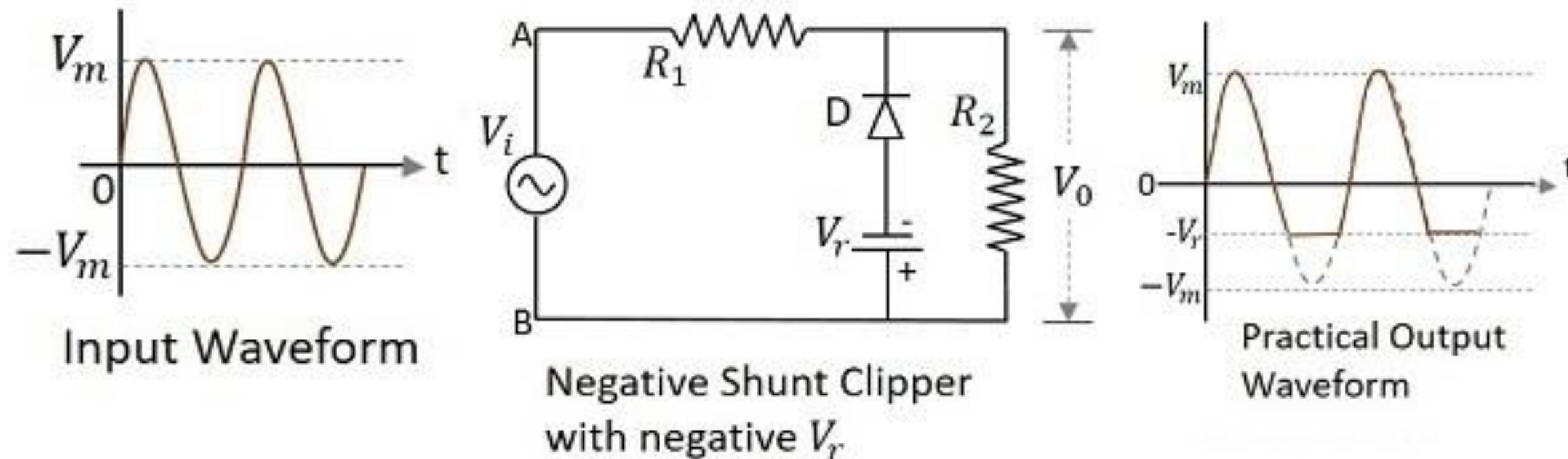
- A Clipper circuit in which the diode is connected in shunt to the input signal and biased with negative reference voltage V_r and that attenuates the negative portions of the waveform, is termed as Negative Shunt Clipper with negative V_r .





Negative Shunt Clipper with negative- V_r

- A Clipper circuit in which the diode is connected in shunt to the input signal and biased with negative reference voltage V_r and that attenuates the negative portions of the waveform, is termed as Negative Shunt Clipper with negative V_r .





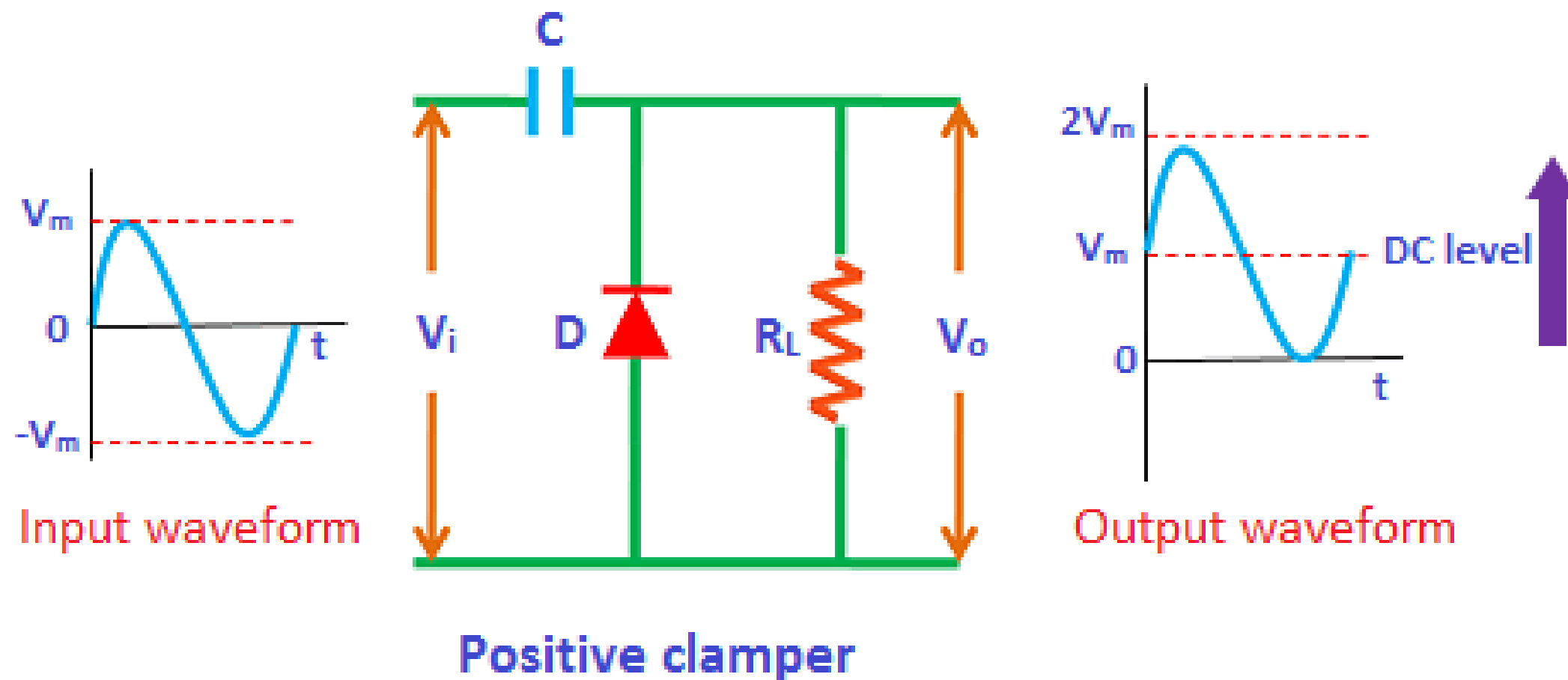
Clamper

- A clamper is an electronic circuit that changes the DC level of a signal to the desired level without changing the shape of the applied signal.
- In other words, the clamper circuit moves the whole signal up or down to set either the positive peak or negative peak of the signal at the desired level.
- A typical clamper is made up of a capacitor, diode, and resistor. Some clampers contain an extra element called DC battery.
- There are few types of clamper circuits, such as
 - ✓ **Positive Clamper**
 - ✓ **Negative Clamper**
 - ✓ **Biased Clamper**



Positive Clamper Circuit

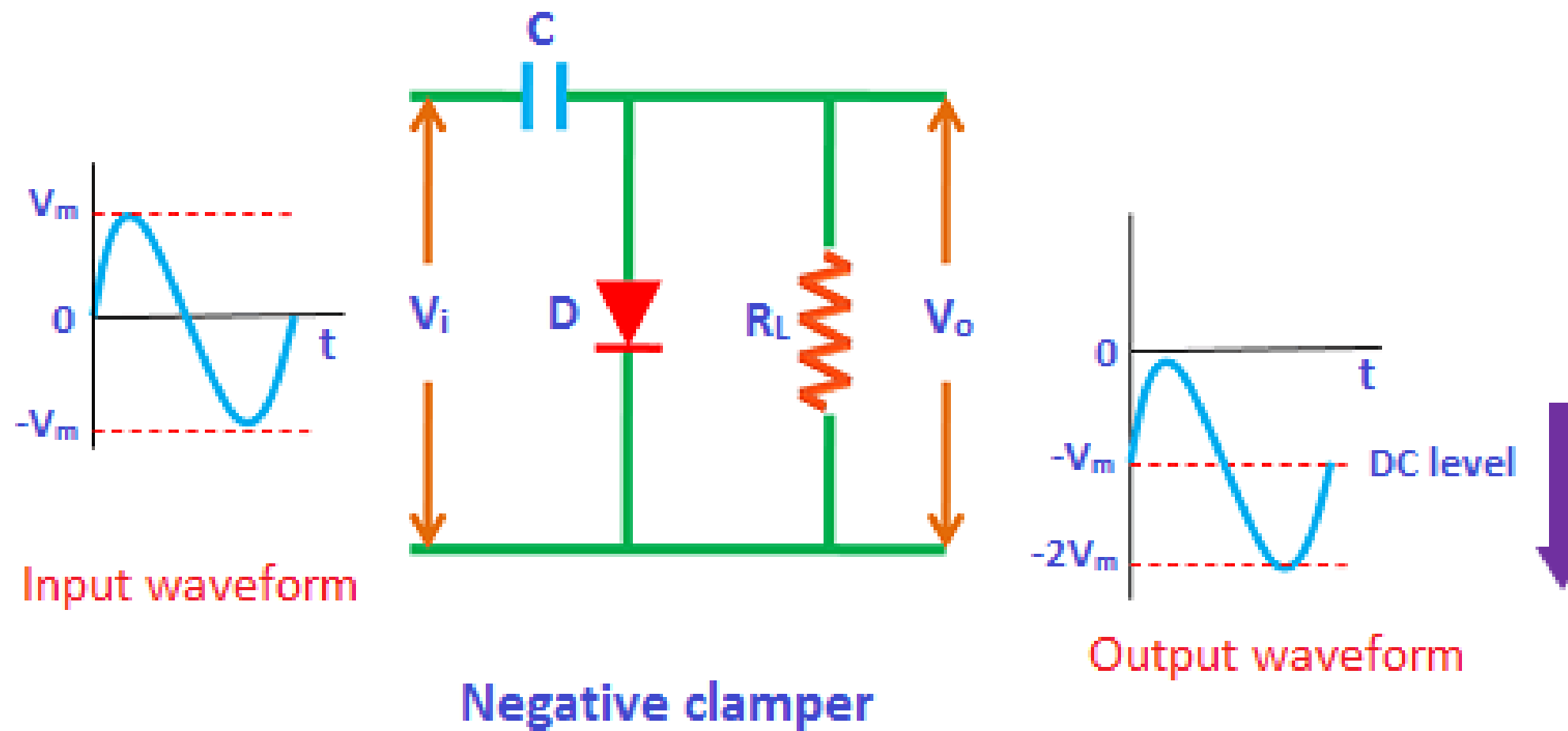
- If the circuit pushes the signal upwards then the circuit is said to be a positive clamper. When the signal is pushed upwards, the negative peak of the signal meets the zero level.
- The positive clamper passes the input signal to the output load when the diode is reverse biased and blocks the input signal when the diode is forward biased.





Negative Clamper Circuit

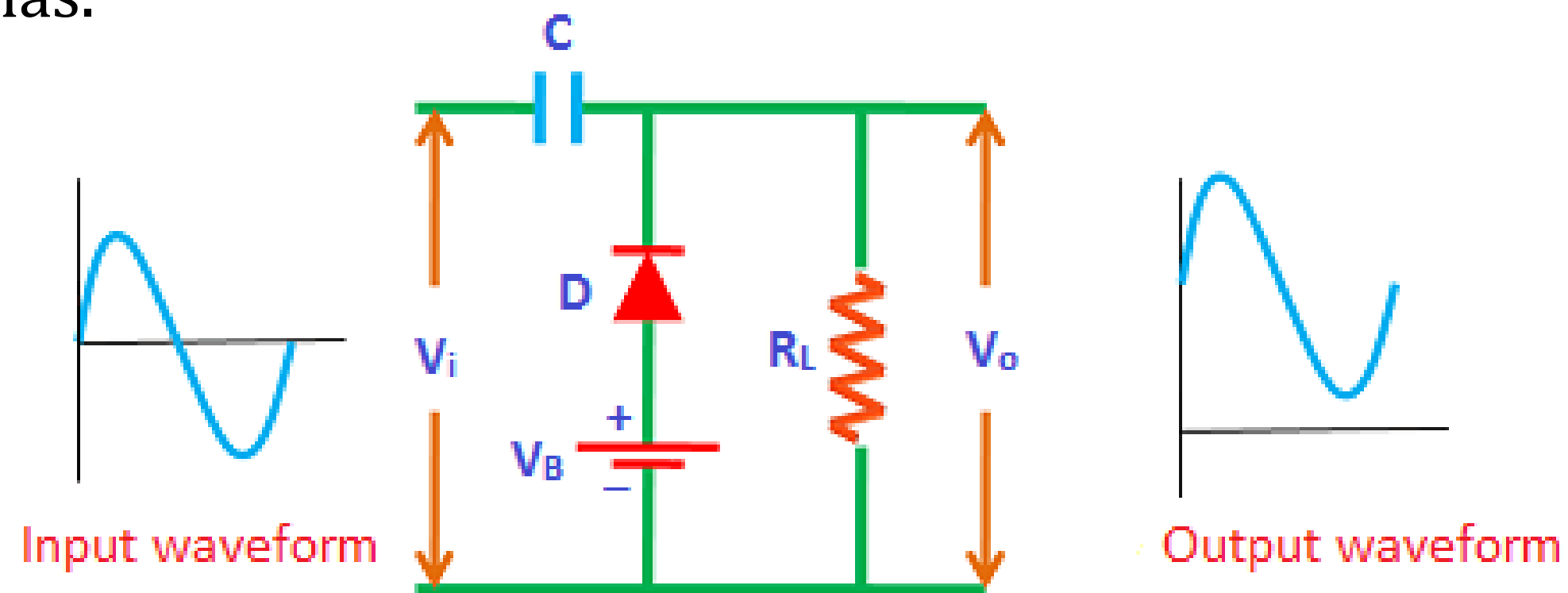
- If the circuit pushes the signal downwards then the circuit is said to be a negative clamper. When the signal is pushed downwards, the positive peak of the signal meets the zero level.





Positive clamper with positive bias

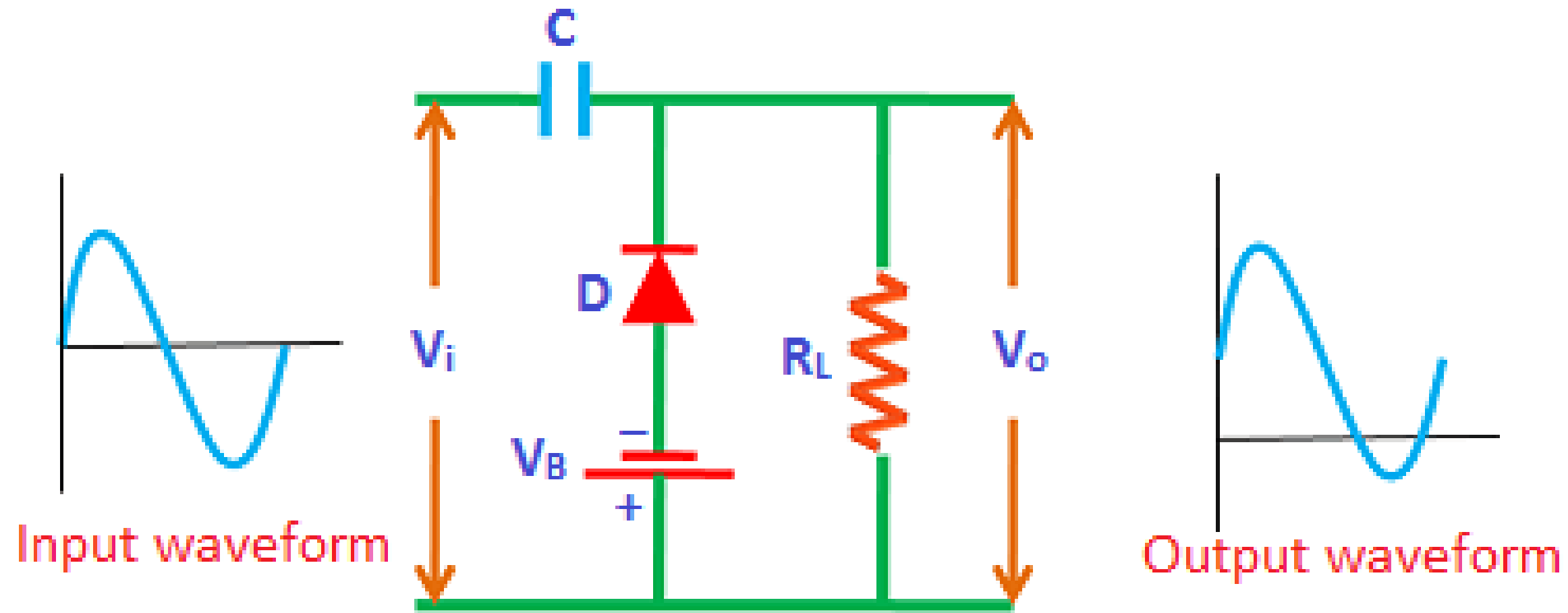
- Sometimes an additional shift of DC level is needed. In such cases, biased clampers are used.
- If positive biasing is applied to the clamper then it is said to be a positive clamper with positive bias.



Positive clamper with positive bias



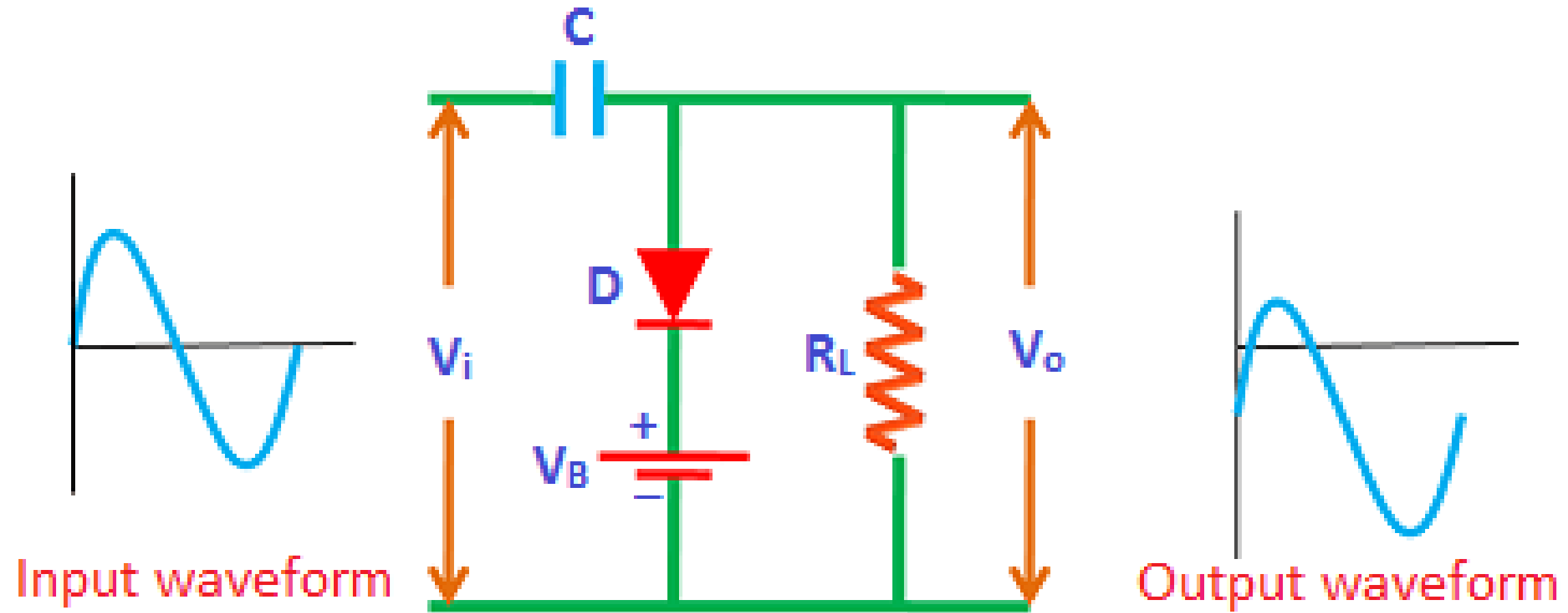
Positive clamper with negative bias



Positive clamper with negative bias



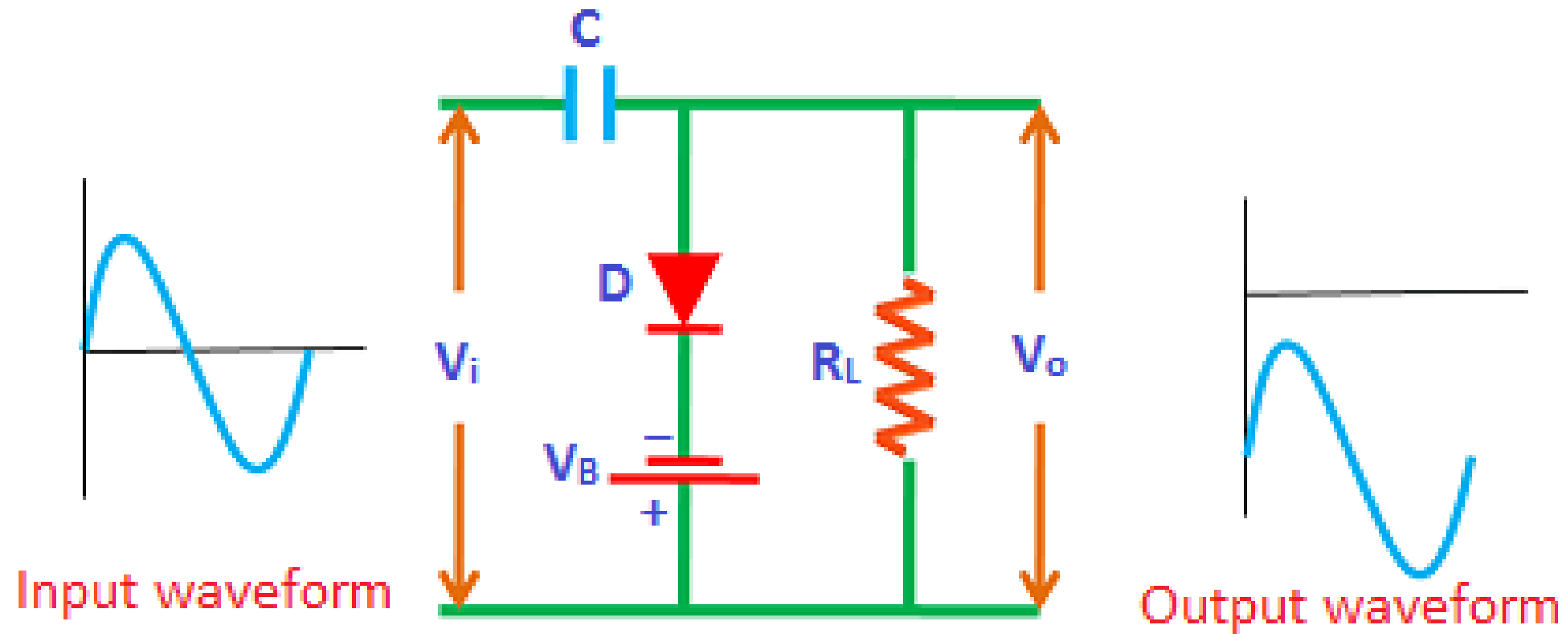
Negative clamper with positive bias



Negative clamper with positive bias



Negative clamper with negative bias



Negative clamper with negative bias