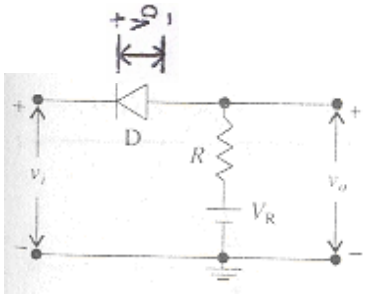
CLIPPERS **UNIT-2**

Series clippers: these are of two types

1. Clipping above the reference level
2. Clipping below the reference level

Clipping above the reference level:
Circuit diagram is shown below,



Consider diode is an ideal one.
Here $V_D = V_i - V_R$

If $V_i > V_R$, V_D =positive value so diode is in OFF state,

Then $V_O = V_R$

If $V_i < V_R$, V_D =negative value so diode is in ON state, Then $V_O = V_i$

Here the input waveform above the reference level (V_R) has been clipped means positive peak(negative base)of the input signal is clipped.

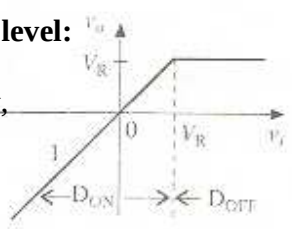
Transfer characteristics:

It is a plot of output voltage as a function of input voltage.

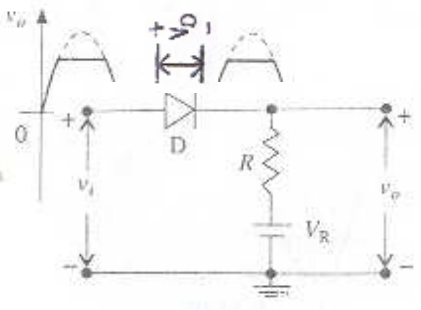
If $V_i > V_R$, Then $V_O = V_R$ so slope of transfer characteristics curve is zero(since output is independent of input).

If $V_i < V_R$, Then $V_O = V_i$ so slope of transfer characteristics curve is one.

Clipping below the reference level:



Circuit diagram is shown below,



Consider diode is an ideal one.
Here $V_D = V_i - V_R$

If $V_i > V_R$, V_D =positive value so diode is in ON state,

Then $V_O = V_i$

If $V_i < V_R$, V_D =negative value so diode is in ON state, Then $V_O = V_R$

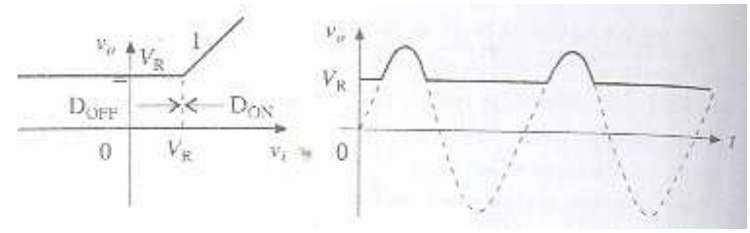
Here the input waveform below the reference level (V_R) has been clipped means negative peak(negative base)of the input signal is clipped.

Transfer characteristics:

It is a plot of output voltage as a function of input voltage.

If $V_i > V_R$, Then $V_O = V_i$ so slope of transfer characteristics curve is one

If $V_i < V_R$, Then $V_O = V_R$ so slope of transfer characteristics curve is zero.



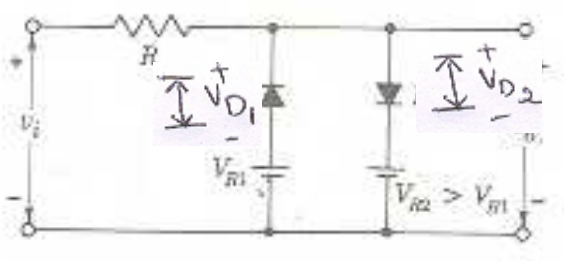
Clipping at two independent levels (two level slicer) :

Circuit diagram is shown below,

Assume diodes are ideal.

Here $V_{D1} = V_i - V_{R1}$

And $V_{D2} = V_i - V_{R2}$
(assume $V_{R2} > V_{R1}$)



If $V_i > V_{R2}$, V_{D1} is positive(D1 is OFF) & V_{D2} is also positive(D2 is ON),so $V_O = V_{R2}$

If $V_i < V_{R1}$, V_{D1} is negative(D1 is ON) & V_{D2} is also negative(D2 is OFF),so $V_O = V_{R1}$

If $V_{R1} < V_i < V_{R2}$, V_{D1} is positive(D1 is OFF) & V_{D2} is negative(D2 is OFF),

so $V_O = V_i$

Transfer characteristics:
It is a plot of output voltage as a function of input voltage.

If $V_i > V_{R2}$, Then $V_O = V_{R2}$ so slope of transfer characteristics curve is zero

If $V_i < V_{R1}$, Then $V_O = V_{R1}$ so slope of transfer characteristics curve is zero.

If $V_{R1} < V_i < V_{R2}$, Then $V_O = V_I$ so slope of transfer characteristics curve is one.