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When a diode is forward biased above its nominal "turn-on" voltage, it is said to be on. When biased below the turn-on voltage, it is said to be "off". Help John Genius make an educated initial assumption about the operating region of each diode in the circuit below.

Check the one correct statement below, for each case:

Choices: **On, Off, cannot tell-we make a guess.**
- For diode D1
- For diode D2
- For diode D3

*Tries 0/6*
Help John Genius make an educated initial assumption about the operating region of each diode in the circuit below.

Check the one correct statement below, for each case:

Choices: On, Off, cannot tell—we make a guess.
- For diode D1
- For diode D2
- For diode D3

Tries 0/6
It is given that $V_{\text{clip}} = 1.5$ V, $R = 14$ Ω, and $V_{\text{on}} = 2$ V for the diode (assume offset-ideal model). Suppose $V_s$ can take any value from $-10$ to $+10$ V. What are the maximum and minimum values that $V_{\text{out}}$ might take on?

- maximum $V_{\text{out}} = \phantom{0}V$
- minimum $V_{\text{out}} = \phantom{0}V$

*Tries 0/6*
It is given that $V_{\text{clip}} = 2.5 \, \text{V}$, $R = 11 \, \Omega$, and $V_{\text{on}} = 2 \, \text{V}$ for the diode (assume offset-ideal model). Suppose $V_s$ can take any value from $-10$ to $+10 \, \text{V}$. What are the maximum and minimum values that $V_{\text{out}}$ might take on?

Maximum $V_{\text{out}} = \underline{\text{}} \, \text{V}$

Minimum $V_{\text{out}} = \underline{\text{}} \, \text{V}$

Tries 0/12
It is given that $V_{\text{clip}} = -1 \text{ V}$ (note the negative sign!), $R = 15 \Omega$, and $V_{\text{on}} = 2 \text{ V}$ for the diode (assume offset-ideal model). Suppose $V_s$ can take any value from -10 to +10 V. What are the maximum and minimum values that $V_{\text{out}}$ might take on?

maximum $V_{\text{out}} = [\text{ }] \text{ V}$

minimum $V_{\text{out}} = [\text{ }] \text{ V}$

Tries 0/6
A 4V triangular wave is applied to the diode circuit below. In the analysis of the circuit, assume that the diode is ideal with $V_{ON} = 0$ V.

With $R = 2$ kohms and $V_{clip} = 2$ V.

If $V_s$ is as below:

Which output waveform below is correct (for $V_o$)?

a) [Diagram of waveform a)

b) [Diagram of waveform b)
The correct output waveform for $V_0$ is:

A. a  
B. b  
C. c

*Tries 0/6*

Find the value of $V_1$ for the correct waveform

$V_1 = \underline{\text{}}$ V

*Tries 0/6*

Find the value of $V_2$ for the correct waveform

$V_2 = \underline{\text{}}$ V

*Tries 0/6*

You are given that $v_{BE} = 0.7$ V when the base-emitter junction is in the ON state and that $R_B = 50$ kOhms. The input voltage $v_i = 2$ V.

Use KVL on the left side of the circuit schematic above to find the value of the current, $i_B$.

$i_B = \underline{\text{}}$ microAmps

*Tries 0/6*
You are given that $v_{BE} = 0.6 \text{ V}$ when the base-emitter junction is in the ON state and that $R_B = 10 \text{ kOhms}$.

What is the value of the input voltage, $v_i$, that produces base current $i_B = 50 \text{ microAmps}$?

$v_i = \square \text{ V}$

The following circuit schematic is a model of a transistor (valid if not in saturation). The diamond-shaped current source is a dependent current source that supplies a current proportional to a current in another region of the circuit. You may assume the current flow in the dependent current source is $\beta I_B$.

Assume

Assume: $V_{ON}=0.7 \text{ V}$ for the diode $\beta=100$ and that: $V_{CC}=6 \text{ V}$ $R_C=560 \Omega$ $R_B=50000 \Omega$
Let $V_i = 3.2$ V. What is the value of $V_o$?

$V_o =$

*Tries 0/6*

Let $V_i = 1.7$ V. What is the value of $V_o$?

$V_o =$

*Tries 0/6*

Let $V_i = 5.2$ V. What is the value of $V_o$?

$V_o =$

*Tries 0/6*

You are now vested in ECE110 circuit concepts, it is time to have a few educated discussions! Take a look at the ECE110 BLOG and join in the discussions you find interesting!

https://illinois.edu/blog/view/6273

**21.** Okay. I did it.

*Tries 0/6*