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LE2.4

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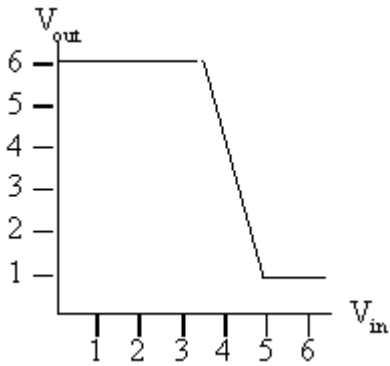
LE2.4.1: Inverter madness

4 points possible (ungraded)

As VP of Engineering at Inverters-R-Us, you've received the following four voltage transfer characteristics from your integrated circuit development lab. The goal is to decide which of the devices could be used as a combinational inverter with positive noise margins. In other words, the device obeys the static discipline and there are choices for V_{OL} , V_{IL} , V_{IH} , and V_{OH} for which $V_{IL} - V_{OL} > 0$ and $V_{OH} - V_{IH} > 0$.

For each device, indicate whether it can be used as combinational inverter.

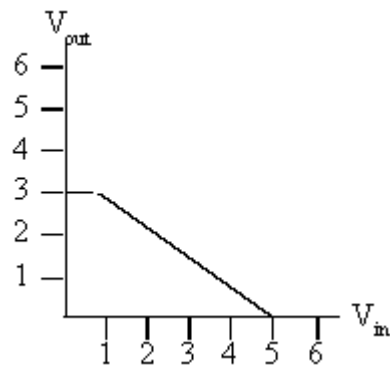
(A)



☒ Yes, usable :)

☐ No, not usable :(

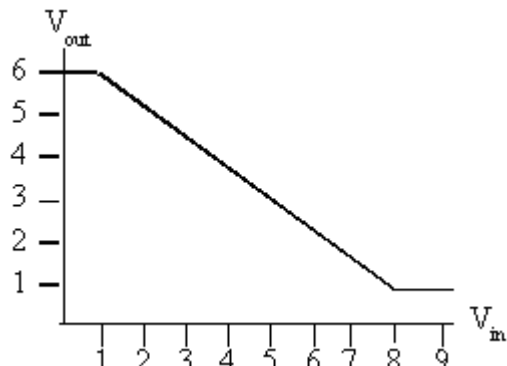
(B)



☐ Yes, usable :)

☒ No, not usable :(

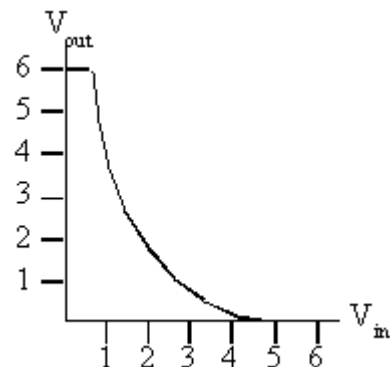
(C)



☐ Yes, usable :)

☒ No, not usable :(

(D)



☒ Yes, usable :)

☐ No, not usable :(

Explanation
Device A: $V_{OL} = 1V, V_{IL} = 3.5V, V_{IH} = 5V, V_{OH} = 6V$
Device B: no values that would obey the static discipline exist, the gain is never greater than one
Device C: no values that would obey the static discipline exist, the gain is never greater than one
Device D: $V_{OL} = .5V, V_{IL} = 1V, V_{IH} = 3.5V, V_{OH} = 6V$

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Answers are displayed within the problem

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no values that would obey the static discipline exist, the gain is never greater than one?

4

Hi, I would like to know what this answer mean and how you can conclude it by seeing the graphs, Thx

problem with voltages...

2

is it absolutely necessary that the voltages folow the order $v_{ol} < v_{il} < v_{ih} < v_{oh}$? or is just a convention?? thanks in advance..

C and D

2

I can't understand why the answers of C and D are what they are. Can someone please explain these graphs.

Graph of D

4

Hello, I am wondering about the mention in the video about the combinatorial device's graph having to fit into a square to ensure an...

Device D voltage levels

2

Hi, I could conclude that V_{il} is 1V and V_{oh} is 6V, but I don't understand other two. Why V_{ol} could not be 1V, or similar, and why $V_{i...}$

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Calculator

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