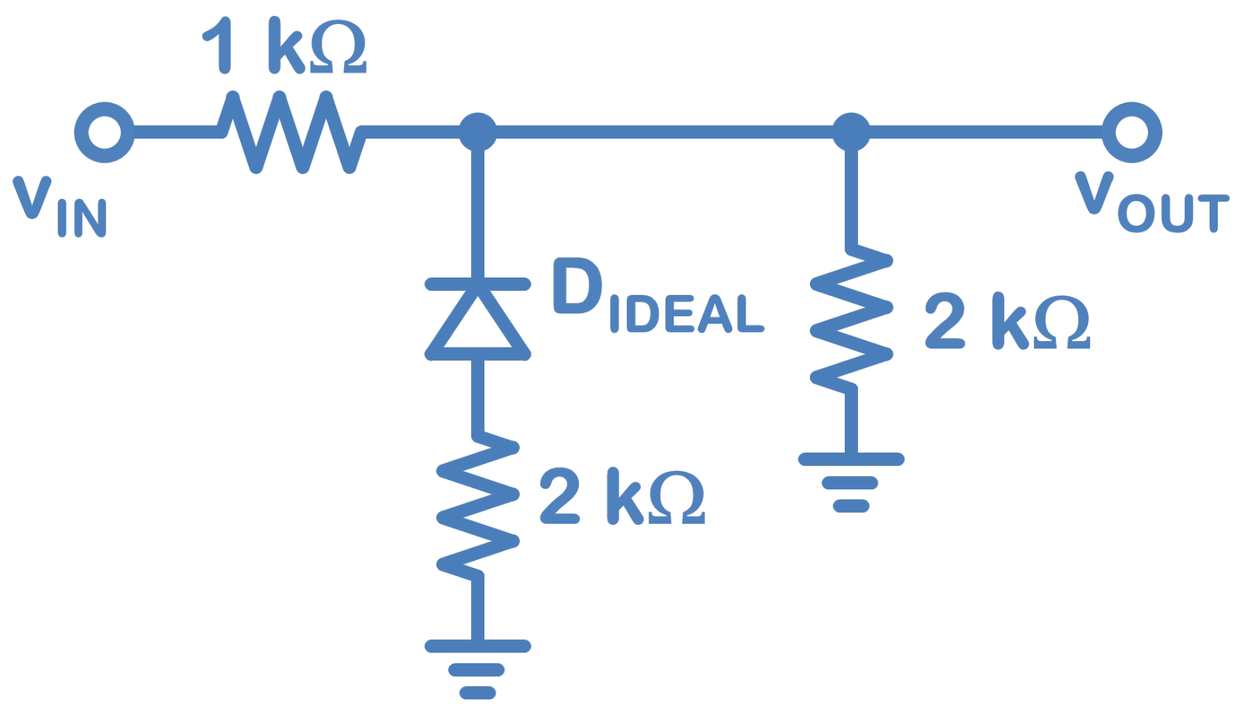
EECS312 Quiz 2



Find $v_{OUT}(v_{IN})$ and the range of v_{IN}. Do both FB and RB.

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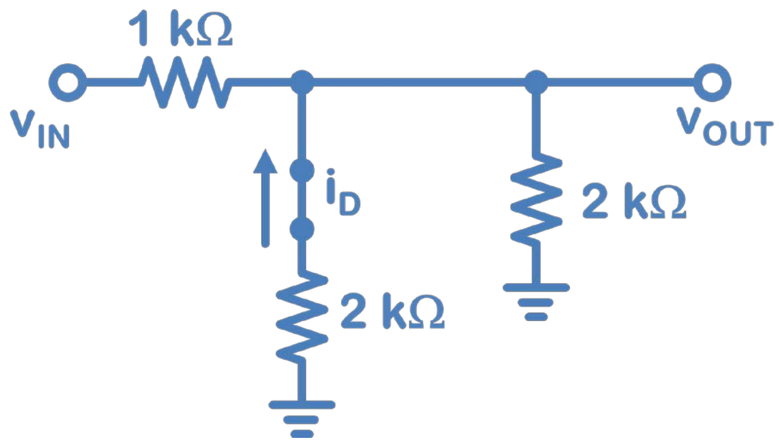

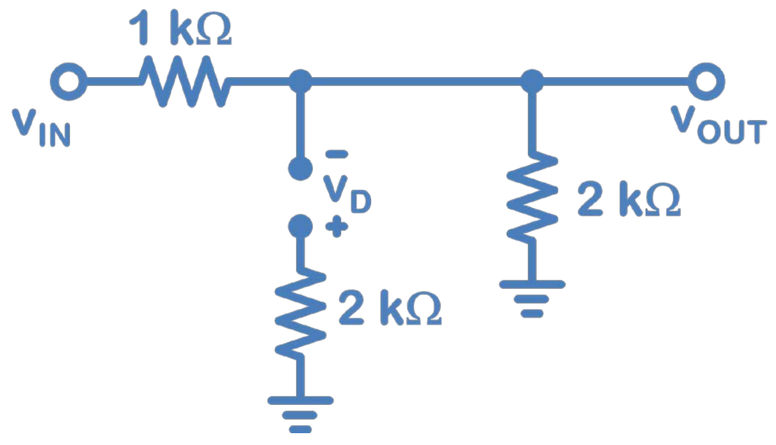

Find $v_{OUT}(v_{IN})$ and the range of v_{IN} that Reverse Bias is valid.

FB: open:

find $v_{out}(v_{in})$ using resistive divider between and 1kΩ and 1kΩ.

$v_{out}(v_{in}) = (1/2)v_{in}$

find $i_D(v_{in}) = -1/2v_{in}/2k = -(1/4k)v_{in}$

Apply inequality condition. $-(1/4k)v_{in} > 0$.

Valid: $v_{in} < 0$.

$v_{out}(v_{in}) = (1/2)v_{in}$ for $v_{in} < 0$

RB: open:

find $v_{out}(v_{in})$ using resistive divider between and 2kΩ and 1kΩ.

$v_{out}(v_{in}) = (2/3)v_{in}$

find $v_D(v_{in}) = 0-v_{out} = -(2/3)v_{in}$

Apply inequality condition. $-(2/3)v_{in} < 0$.

Valid: $v_{in} > 0$.

$v_{out}(v_{in}) = (2/3)v_{in}$ for $v_{in} > 0$