Name PID

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Electrical and Computer Engineering Department

ECE 65 – Spring 2021

Components and Circuits lab

Midterm Exam1

You should submit your handwritten solutions in a PDF format to Gradescope on Friday, 4/16, by 1:50 pm (Pacific Time).

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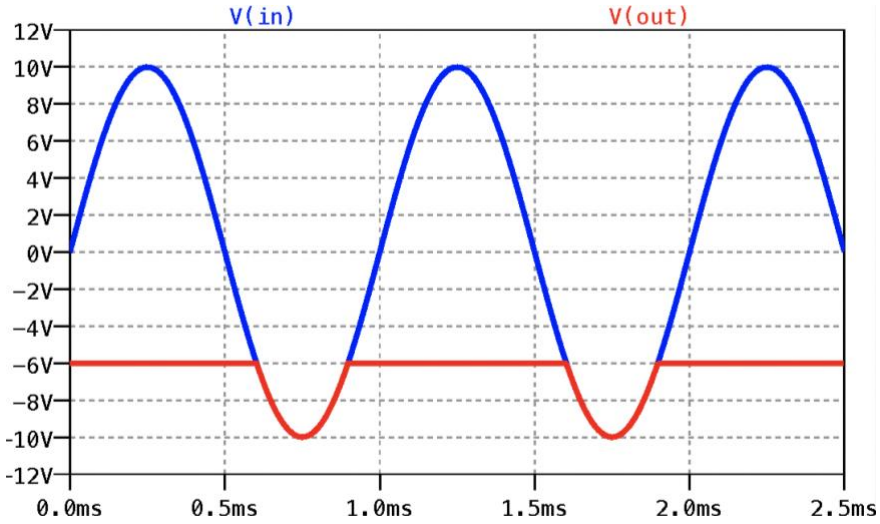
a) Design a diode circuit that would generate the output waveform shown in the below graph when the input signal $v_i = 10\sin(\omega t)$ is applied to the circuit. On the graph, $v_i(t)$ is drawn in blue color and $v_o(t)$ is drawn in red color.

You can use regular PN junction diodes ($V_{D0} = 0.7\ V$), Zener diodes (any desired V_Z), and resistor(s) in your design. Make sure to label v_i and v_o on your circuit diagram.



b) Parametrically solve your designed circuit to find the transfer function and draw the transfer function graph (find the relationship between v_o and v_i for different ranges of v_i and plot v_o vs v_i)

Show your work.