

H.W. #16 EE 221 Spring 2020

Show your work for credit and put a box around each of your answers (follow the hw guidelines!)

1. Book problems 12.13 and 12.15. Verify your answers using LTspice. (4 points each)
2. Design problem – examine the circuit seen below. You’ve been tasked with selecting: 1) the voltage rating of the capacitor and 2) the value of the capacitor. The voltage rating is the maximum value that can be applied across the capacitor without damaging the capacitor. Knowing that good design doesn’t select a value that “just meets the requirements” but rather is larger to ensure that with variations in the capacitor’s value when it’s made, variations with the voltages seen below, aging, etc. the capacitor operation is reliable (to simplify things assume that each voltage source can stop oscillating at any value within its range of operation, for example, V1 and be any value between +32V and –32V). For selecting the value assume the capacitor’s impedance has to be relatively small (at what frequency would you use?). Use digikey.com to select a real capacitor. Note that it’s desirable to use as small of capacitance with as low of a voltage rating as possible to minimize cost and size (consumers don’t like large and expensive electronics). Using LTspice to show that the voltage drop across the capacitor is small for a range of resistor values. (4 points)

