

ENGR 210. Introduction to Circuits and Instruments (4)

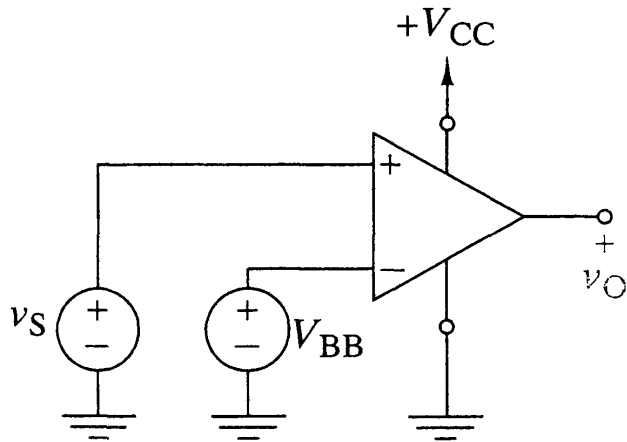
Quiz No. 8

3/21/05

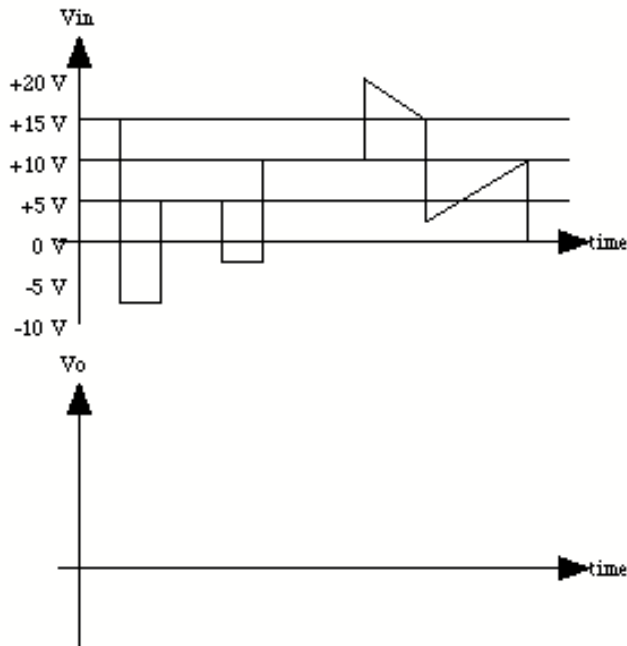
PUT ANSWERS IN THE SPACE PROVIDED AND, IF APPROPRIATE, SHOW YOUR WORK. BE SURE TO STATE ANY ASSUMPTIONS

Problem 1 Comparators (10 points)

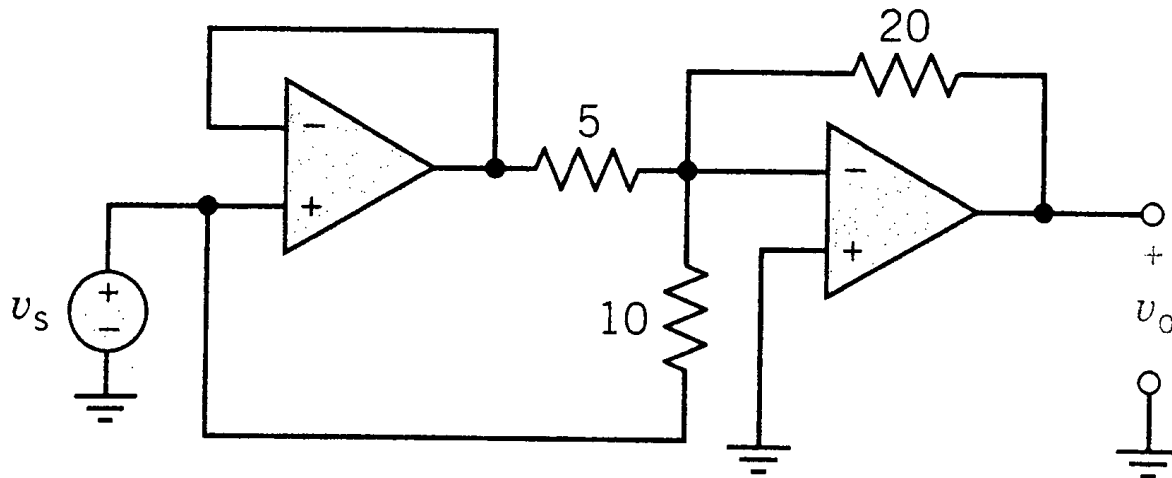
The circuit below has $V_{CC}=+15$ volts and $V_{BB}=+7.5$ volts.



- (a) What is the range of possible output voltages V_o ?
- (b) Suppose V_{in} is the waveform below. Sketch the corresponding values of V_o for this circuit. Be sure to label the values of the output voltages and when any voltages change.



Problem 2 Circuits with Multiple Op-Amps (10 points)



(a) Draw a block diagram of the above circuit showing the function of each OP AMP.

(b) Determine the output voltage v_o for this circuit.