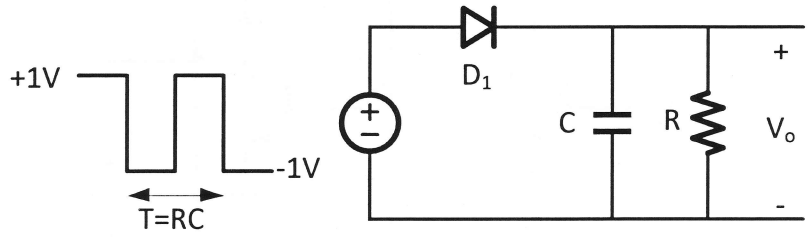
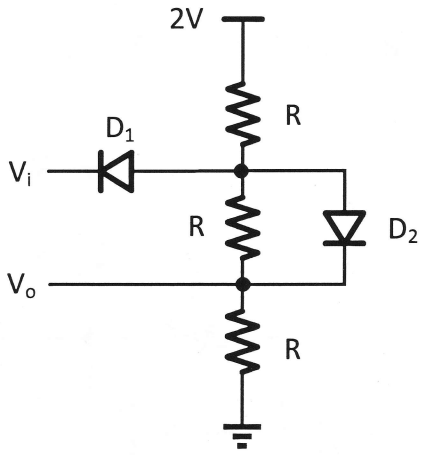
EE115A **Midterm Exam** **Spring 2015**

Total of 4 questions, 90 minutes.

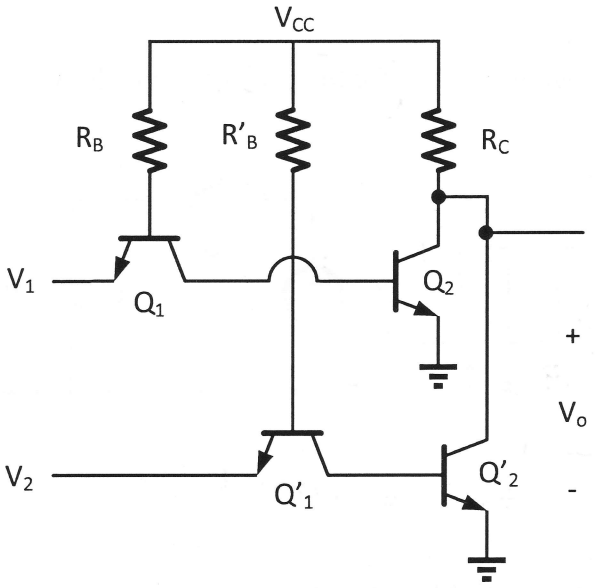
1. Plot the output voltage waveform for the peak detector shown below. Diode is ideal.



2. For the following circuit, plot the output-input characteristics. Diodes are ideal.



3. For the NOR circuit below, describe the circuit functionality and each transistor mode of operation for the case where V_1 is high, but V_2 is low. Find the value of R_C to keep the output transistor at the edge pf saturation. $V_{BE,ON} = 0.6V$, $V_{BC,ON} = 0.4V$, $V_{CE,SAT} = 0.2V$, $R_B = R'_B = 10k\Omega$, $V_{CC} = 5V$, $V_A = \infty$, $\alpha_F = 0.9$, $\alpha_R = 0.5$.



4. Calculate the bias currents, voltages, and the voltage gain of the self-biased amplifier below. $V_{BE,ON} = 0.6V$, $R_B = 10R_C = 12k\Omega$, $V_{CC} = 3V$, $V_A = \infty$, and $\beta = 9$.