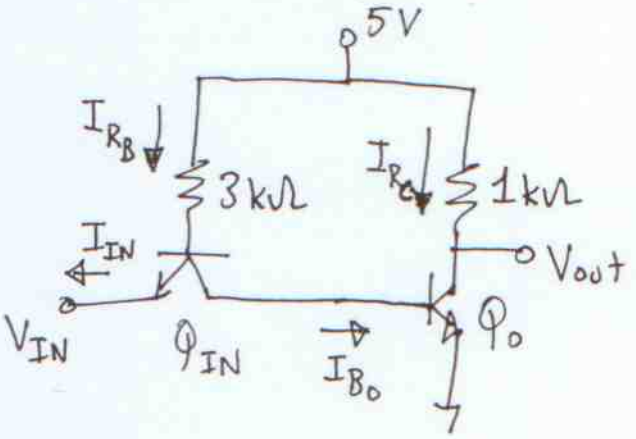
EE 282

HW #5

Due: May 6, 2011

(1) For the basic TTL inverter shown below, determine $I_{IN}, I_{RB}, I_{B_0}, I_{R_C}$ for the following conditions.

a) $V_{IN} = 0V$ b) $V_{IN} = 5V$



$\beta_F = 100$

$V_{BE}(FA) = V_{BC}(RA) = 0.7V$

$V_{BE}(SAT) = 0.8V$

$V_{CE}(SAT) = 0.2V$

$\beta_R = 0.1$

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(2) Sketch VTC of the gate in problem 1.

(3) Calculate the fan-out of the gate in problem 1; if V_{OH} of the driver gate is allowed to 1V voltage drop from no-load condition and driver is allowed to absorb current such that Q_0 is saturated at most with the saturation parameter of 0.85.