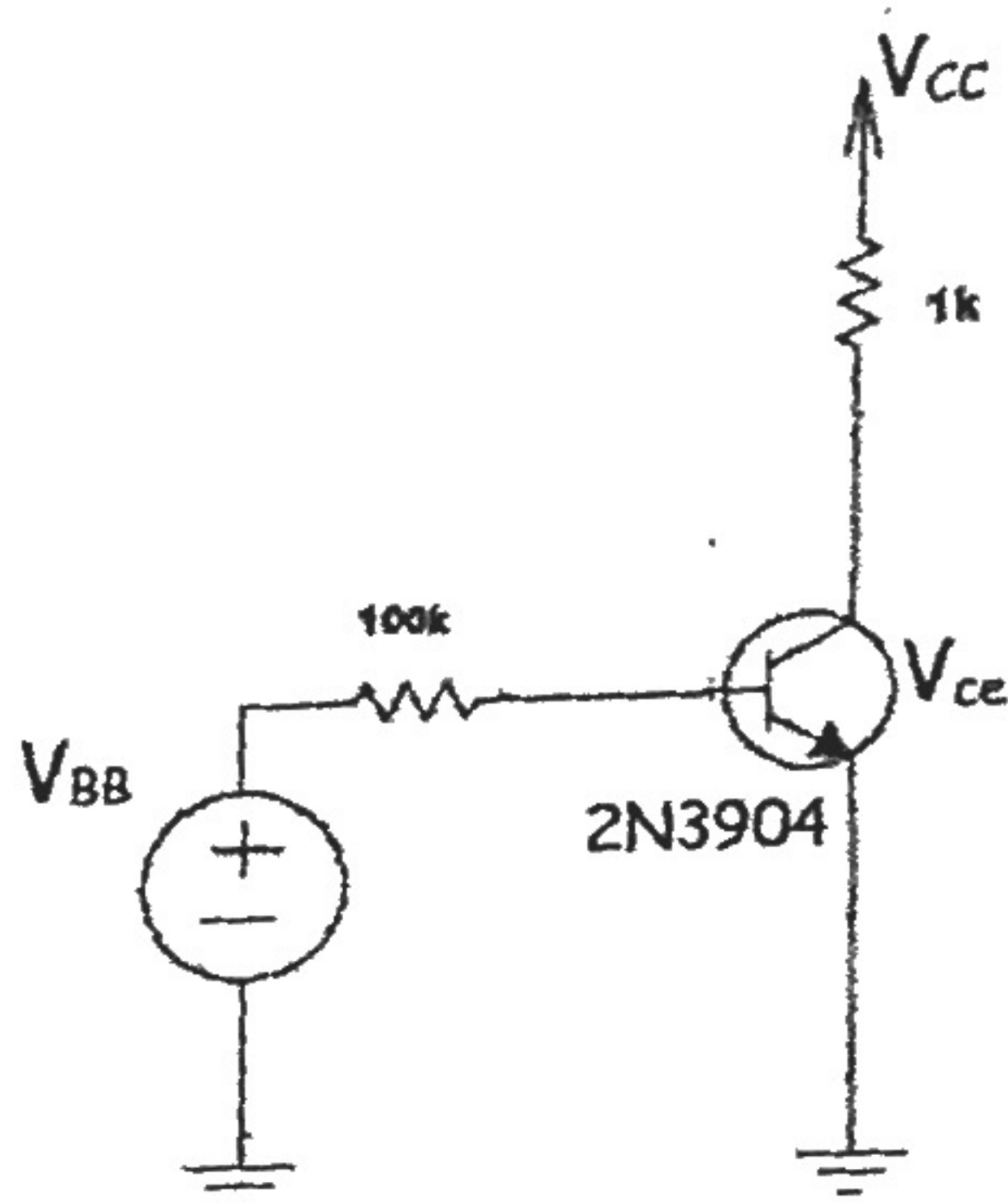
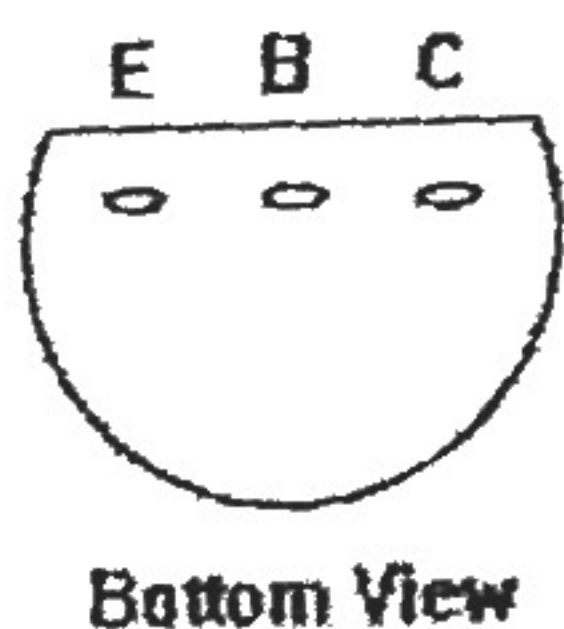


PROCEDURE:

1. Determine the approximate value of β for your transistor circuit below. You should note that datasheets typically give a wide range of beta for transistors. The following is a link to the specification sheet for the 2N3904: <http://www.fairchildsemi.com/ds/2N/2N3904.pdf>. For example, the National Semiconductor lists β for the 2N3904 as ranging from 60 to 360 with a typical value of 150 when $I_C = 10\text{mA}$ and $V_{CE} = 5\text{V}$.
2. The first thing to determine if a transistor circuit is operating properly is to see if you have the base control. This can be accomplished by varying V_{BB} , observing the variation in I_B (the voltage drop across R_B), and also observing the variation in I_C with I_B (the voltage drop across R_C).
3. Set V_{BB} such that I_C does not exceed 10mA (the exact value is not important) and observe I_B and I_C .
4. Calculate β and compare your values with those from two more people in your class.
5. Using the circuit shown below, set V_{BB} such that $I_B = 0\ \mu\text{A}$ and Set $V_{ce} = 0\text{ V}$ initially, then increase V_{ce} and observe the behavior of I_C vs. V_{CE} for $V_{CE} = 0\text{--}10\text{V}$. Be sure to verify that I_B remains a constant throughout this procedure.



6. Record the values in Table 1, and repeat step 5 for the base currents listed.

I_B	I_C										
	$V_{ce} = 0\text{ V}$	$V_{ce} = 1\text{ V}$	$V_{ce} = 2\text{ V}$	$V_{ce} = 3\text{ V}$	$V_{ce} = 4\text{ V}$	$V_{ce} = 5\text{ V}$	$V_{ce} = 6\text{ V}$	$V_{ce} = 7\text{ V}$	$V_{ce} = 8\text{ V}$	$V_{ce} = 9\text{ V}$	$V_{ce} = 10\text{ V}$
0 μA											
10 μA											
20 μA											
30 μA											
40 μA											
50 μA											
60 μA											
70 μA											
80 μA											
90 μA											
100 μA											

7. Construct a characteristic curve using Microsoft Excel or Mathworks MATLAB with I_C on the vertical axis and V_{ce} on the horizontal axis.