PROCEDURE:

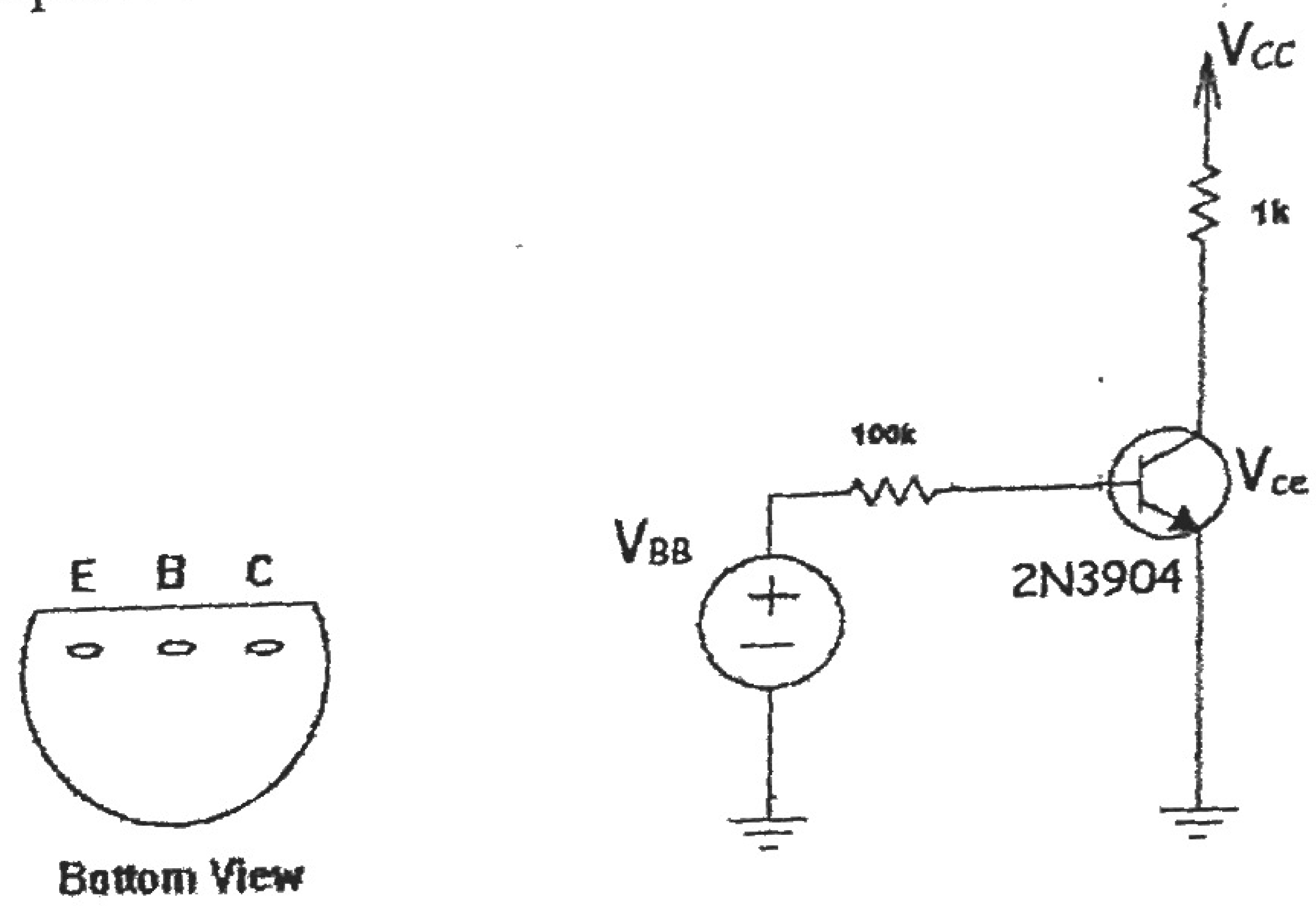
1. Determine the approximate value of β for your transistor circuit below. You should note that datasheets typically give a wide range of beta for transistors. The following is a link to the specification sheet for the 2N3904: http://www.fairchildsemi.com/ds/2N/2N3904.pdf. For example, the National Semiconductor lists β for the 2N3904 as ranging from 60 to 360 with a typical value of 150 when $I_C = 10mA$ and $V_{CE} = 5v$.

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 $I_B = 0\ \mu A$ and Set $V_{ce} = 0$ V initially, then increase V_{ce} and observe the behavior of I_C vs. V_{CE} for $V_{CE} = 0$—10V. 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 V	V_{ce} = 1 V	V_{ce} = 2 V	V_{ce} = 3 V	V_{ce} = 4 V	V_{ce} = 5 V	V_{ce} = 6 V	V_{ce} = 7 V	V_{ce} = 8 V	V_{ce} = 9V	V_{ce} = 10V
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.