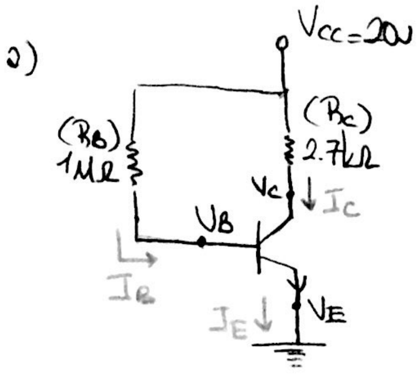
Part 1

* Use 2N3904

a)



b) Measure the voltages V_{BE} and V_{RC}.

c) $I_B = \frac{20 - V_{BE}}{1M\Omega}$, $I_C = \frac{V_{RC}}{2.7k\Omega}$

* Since R_B resistance value is so high, there will be a multimeter loading effect. In order to avoid the loading effect, we should measure V_{BE} instead of measuring the voltage on R_B directly.

d) Insert your values in Table 8.1 Find β value. $\beta = I_C / I_B$

Part 2

a) Again find I_B and I_C values by calculation; compare them with the measured values.

$I_B = \frac{20 - 0.7}{1M\Omega} = 19.3\mu A$

$I_C = \beta . I_B$

b) Calculate V_B, V_C, V_E and V_{CE}:

$V_B = 20 - I_B(1M\Omega)$
$V_C = 20 - I_C(2.7k\Omega)$
$V_E = 0$

c) Measure V_B, V_C, V_E and V_{CE} from the circuit. Insert V_{CE} value in Table 8.1.

d) Remove 2N3904, and insert 2N4401 transistor. Repeat same steps for this case as well. Record your values in Table 8.1, find β for this transistor.

e) Calculate the magnitude of the percent change in each quantity due to a change in transistors.