

EEE210 : Electronic Circuits and Devices

Lab #7 : Biasing of a BJT

Experimental work : Use the NPN transistor 2N3904 or an equivalent. The pin out of the 2N3904 is presented in figure 1.

Build each of the circuits in figure 2. Measure V_B , V_C and V_E . Calculate V_{BE} , V_{CE} . Calculate I_B , I_C noting that :

$$I_B = \frac{15 \text{ V}}{R_1} - \frac{V_B}{R_1 || R_2} \quad (\text{for circuits \#2, \#3, \#4})$$

$$I_C = \frac{15 \text{ V} - V_C}{R_C}$$

Note : Because the base current maybe very small, the above formula for I_B may yield negative values; this is due to the inaccuracy of the instruments and the resistors.

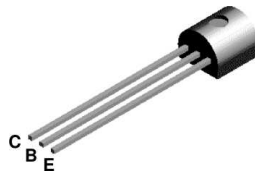
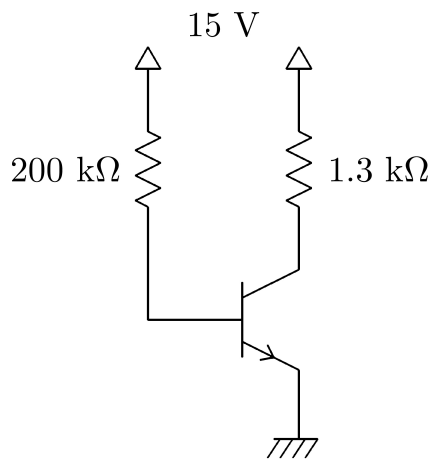
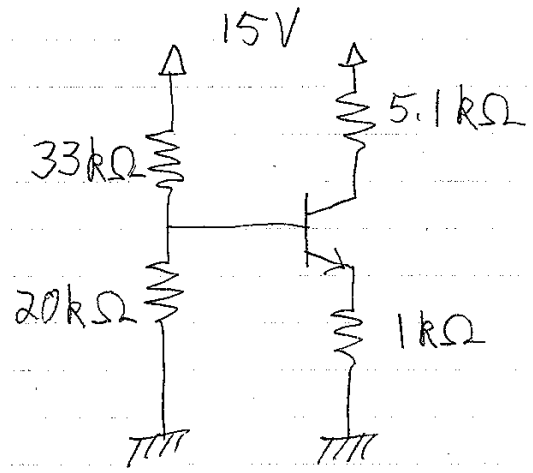


FIGURE 1 –

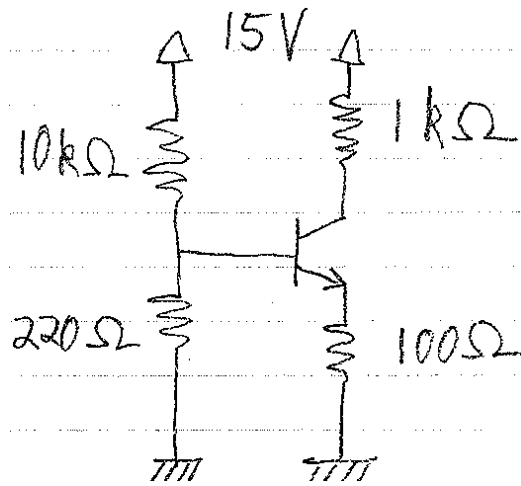
Report : Calculate (theoretically) the Q -point of the BJTs in the circuits of figure 2 using the static current gain $\beta = 180$. Compare the theoretical Q -points with the measured Q -points.



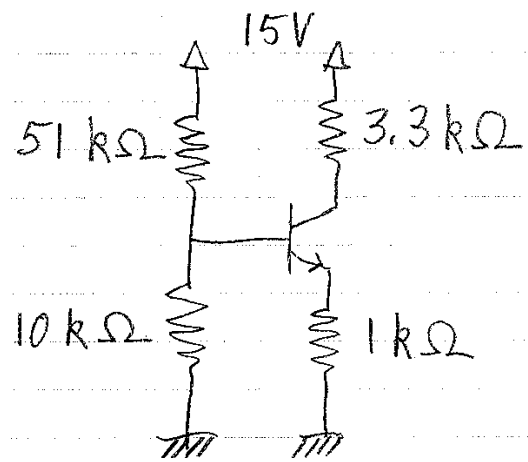
(a) circuit #1



(b) circuit #2



(c) circuit #3



(d) circuit #4

FIGURE 2 -