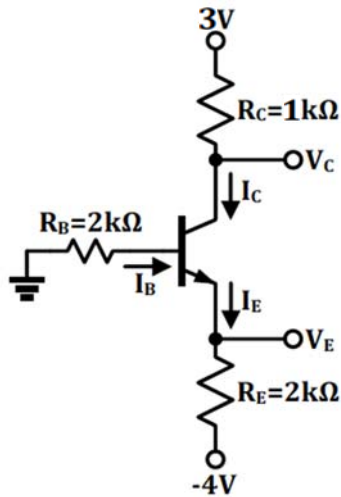
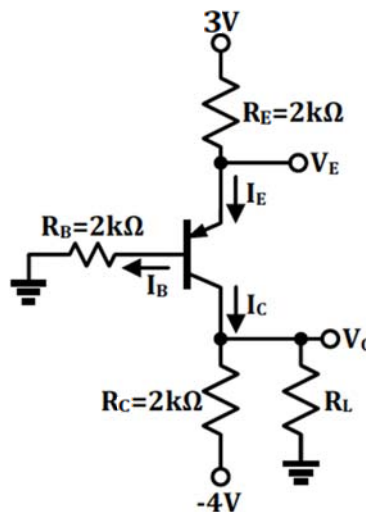


1. Consider the NPN transistor circuit shown below. Given $V_{BE(on)} = 0.7V$, $V_{CE(sat)} = 0.2V$, $\beta = 100$.



- Find I_B, I_C, I_E, V_C and V_E
- What is the region of operation? Why?
- Find the maximum value of R_C so that it is the forward active region.

2. Consider the PNP transistor circuit below. Given $V_{EB(on)} = 0.7V$, $V_{EC(sat)} = 0.2V$, $\beta = 50$ and $R_L = 2.5k\Omega$.



- Find I_B , I_C , I_E , V_C , and V_E .
- What is the region of operation? Why?
- What are the maximum and minimum values of R_L so that the transistor remains in the forward active region.

3. Given $V_{BE(on)} = 0.7V$, $\beta = 100$, $r_o \rightarrow \infty$, determine the voltage gain $A_v = \frac{v_{out}}{v_{in}}$. Assume $V_T = 25mV$.

