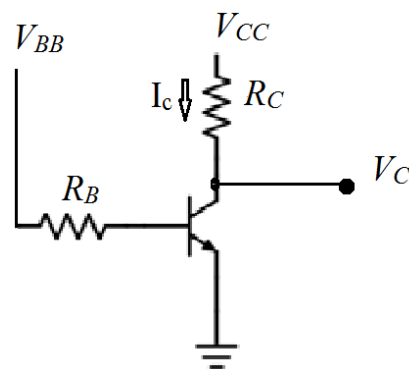


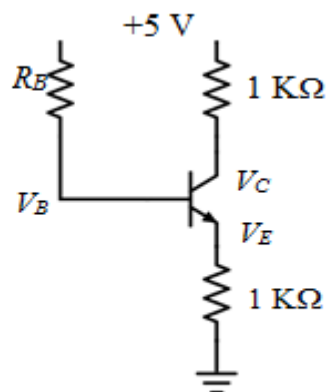
Home Assignment-11

Q1. For the circuit shown in below fig. let, $V_{CC} = 5V$, $R_C = 1\text{ K}\Omega$, and $R_B = 20\text{ K}\Omega$. The BJT has $\beta = 50$. Find the value of V_{BB} that results the transistor operating:

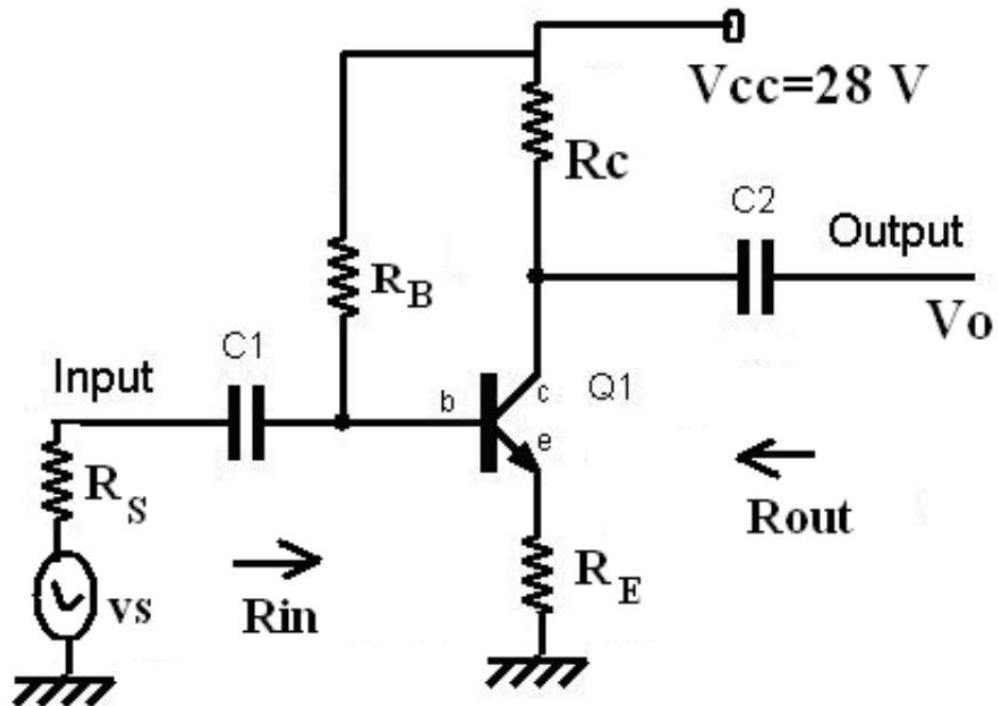
- (a) In the active mode with $V_C = 1V$
- (b) At the edge of saturation.
- (c) Deep in saturation with $\beta_{\text{forced}} = 10$.



Q2: For the circuit in Fig. 2, find V_B , V_E , and V_C for $R_B = 100\text{ K}\Omega$, $10\text{ K}\Omega$ and $1\text{ K}\Omega$. Let $\beta = 100$.



Q3: For the following transistor amplifier given in the figure, if $R_S = 0\Omega$, $R_C = 2.4\text{ K}\Omega$, $R_E = 1\text{ K}\Omega$, $R_B = 620\text{ K}\Omega$, $I_{CQ} = 4.108\text{ mA}$ and $\beta = 110$. Draw the small signal equivalent model of the amplifier. Find the values of R_{in} , R_{out} and A_v .



Q4: For the following transistor amplifier given in the figure, if $R_S = 0\Omega$, $R_1 = 90\text{ K}\Omega$, $R_2 = 10\text{ K}\Omega$, $R_C = 5\text{ K}\Omega$, $R_E = 1\text{ K}\Omega$, $V_{CC} = 20\text{ V}$ and $\beta = 100$. Given that $I_{CQ} = 1.18\text{ mA}$, find small signal gain of this circuit.

