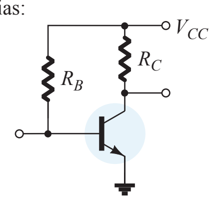
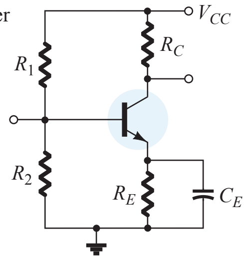
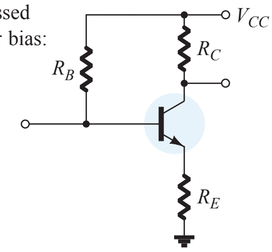
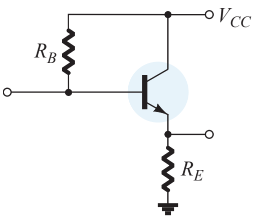
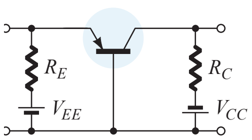
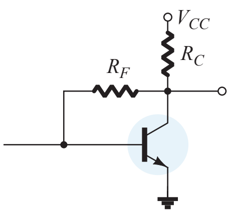
TABLE 8.1 Relative Levels for the Important Parameters of the CE, CB, and CC Transistor Amplifiers

Configuration	Z_i	Z_o	A_v	A_i
Fixed-bias:  	Medium (1 kΩ) $= R_B \parallel \beta r_e$ $\cong \beta r_e$ $(R_B \ge 10\beta r_e)$	Medium (2 kΩ) $= R_C \parallel r_o$ $\cong R_C$ $(r_o \ge 10R_C)$	High (−200) $= -\frac{(R_C \parallel r_o)}{r_e}$ $\cong -\frac{R_C}{r_e}$ $(r_o \ge 10R_C)$	High (100) $= \frac{\beta R_B r_o}{(r_o + R_C)(R_B + \beta r_e)}$ $\cong \beta$ $(r_o \ge 10R_C,$ $R_B \ge 10\beta r_e)$
Voltage-divider bias:  	Medium (1 kΩ) $= R_1 \parallel R_2 \parallel \beta r_e$	Medium (2 kΩ) $= R_C \parallel r_o$ $\cong R_C$ $(r_o \ge 10R_C)$	High (−200) $= -\frac{R_C \parallel r_o}{r_e}$ $\cong -\frac{R_C}{r_e}$ $(r_o \ge 10R_C)$	High (50) $= \frac{\beta(R_1 \parallel R_2) r_o}{(r_o + R_C)(R_1 \parallel R_2 + \beta r_e)}$ $\cong \frac{\beta(R_1 \parallel R_2)}{R_1 \parallel R_2 + \beta r_e}$ $(r_o \ge 10R_C)$
Unbypassed emitter bias:  	High (100 kΩ) $= R_B \parallel Z_b$ $Z_b \cong \beta(r_e + R_E)$ $\cong R_B \parallel \beta R_E$ $(R_E \gg r_e)$	Medium (2 kΩ) $= R_C$ (any level of r_o)	Low (−5) $= -\frac{R_C}{r_e + R_E}$ $\cong -\frac{R_C}{R_E}$ $(R_E \gg r_e)$	High (50) $\cong -\frac{\beta R_B}{R_B + Z_b}$
Emitter-follower:  	High (100 kΩ) $= R_B \parallel Z_b$ $Z_b \cong \beta(r_e + R_E)$ $\cong R_B \parallel \beta R_E$ $(R_E \gg r_e)$	Low (20 Ω) $= R_E \parallel r_e$ $\cong r_e$ $(R_E \gg r_e)$	Low ($\cong$ 1) $= \frac{R_E}{R_E + r_e}$ $\cong 1$	High (−50) $\cong -\frac{\beta R_B}{R_B + Z_b}$
Common-base:  	Low (20 Ω) $= R_E \parallel r_e$ $\cong r_e$ $(R_E \gg r_e)$	Medium (2 kΩ) $= R_C$	High (200) $\cong \frac{R_C}{r_e}$	Low (−1) $\cong -1$
Collector feedback:  	Medium (1 kΩ) $= \frac{r_e}{\frac{1}{\beta} + \frac{R_C}{R_F}}$ $(r_o \ge 10R_C)$	Medium (2 kΩ) $\cong R_C \parallel R_F$ $(r_o \ge 10R_C)$	High (−200) $\cong -\frac{R_C}{r_e}$ $(r_o \ge 10R_C)$ $R_F \gg R_C)$	High (50) $= \frac{\beta R_F}{R_F + \beta R_C}$ $\cong \frac{R_F}{R_C}$