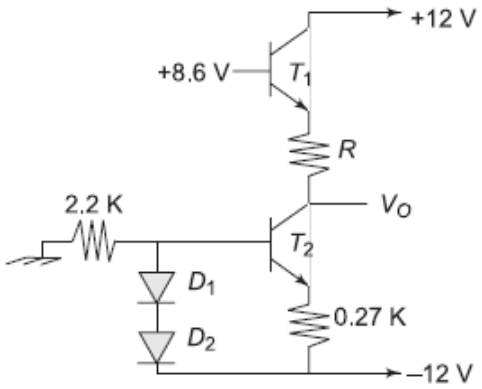
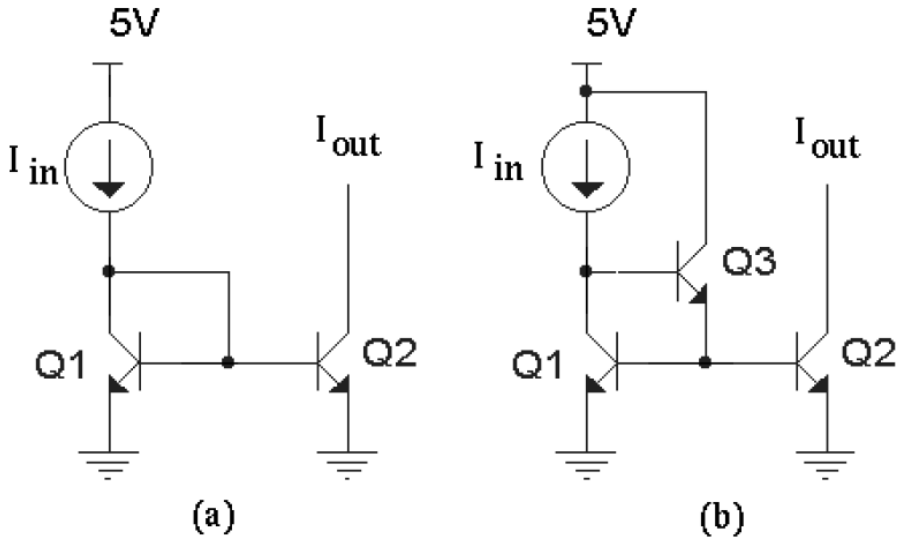
Lista VIII EN2719 Prof Marcelo Perotoni

1. No circuito level shifter, calcule o valor de R para Vo ser nulo. Assuma uma queda de tensão nos diodos de 0.7 V com h_{fe} muito grande.

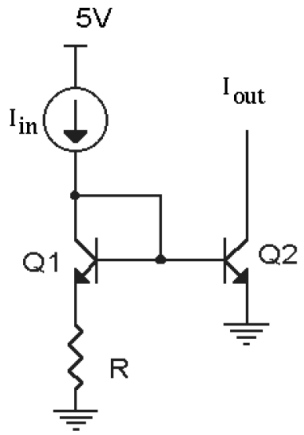
Figure 7.47. Figure 7.47



R: 3.04K



Calcule Iout sabendo que Iin=50 uA, β=100. Assuma todos transistores iguais.
R: (a) I_{out}=46.61 uA (b) I_{out}=49.990 uA



For the circuit in Figure 3.5, assume $\beta = 100$, $I_s = 200E - 18A$, $I_{in} = 100\mu A$ and the desired value of I_{out} is $150\mu A$. Find the required value of R.

R: R=115

Sedra Smith, cap 6, ed. 5

Figure 6.63 shows two circuits for generating a constant current $I_O = 10$ μA which operate from a 10-V supply. Determine the values of the required resistors assuming that V_{BE} is 0.7 V at a current of 1 mA and neglecting the effect of finite β.

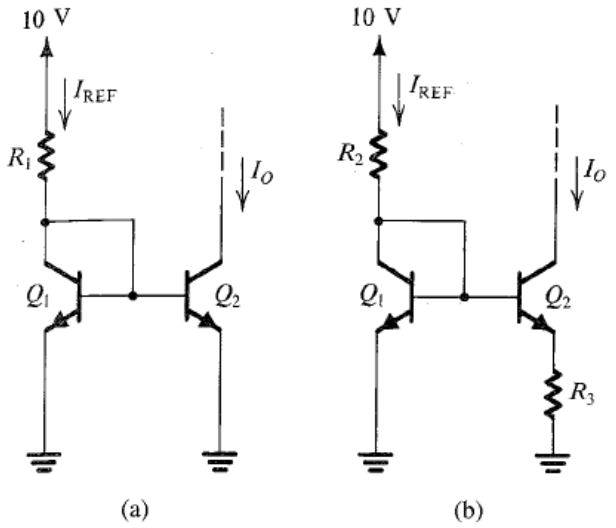


FIGURE 6.63 Circuits for Example 6.14.

R: (a) R1=942 K (b) R2=9K3

NOTA: (a) tem que usar a expressão Vbe vs IC para achar o VBE para 10 uA (b) Escolhe Iref=1 mA

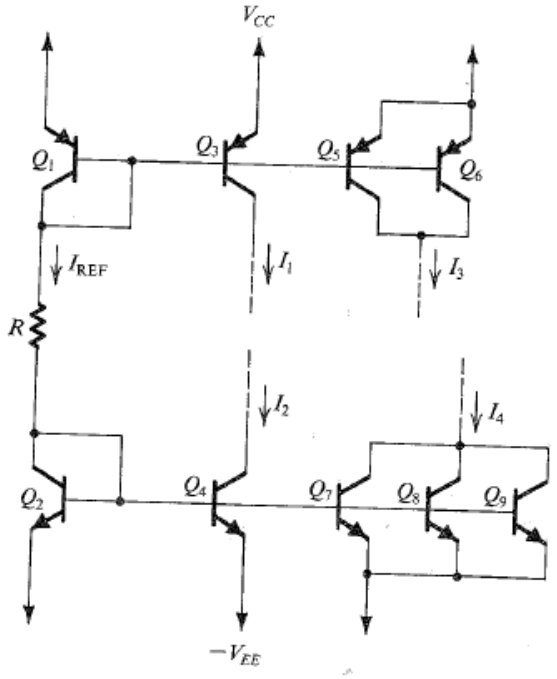


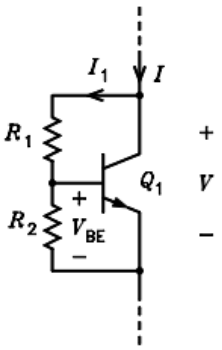
FIGURE 6.11 Generation of a number of constant currents of various magnitudes.

D6.36 Using the ideas embodied in Fig. 6.11, design a multiple-mirror circuit using power supplies of ±5 V to create source currents of 0.2 mA, 0.4 mA, and 0.8 mA and sink currents of 0.5 mA, 1 mA, and 2 mA. Assume that the BJTs have $V_{BE} \cong 0.7$ V and large β.

R: 8K6

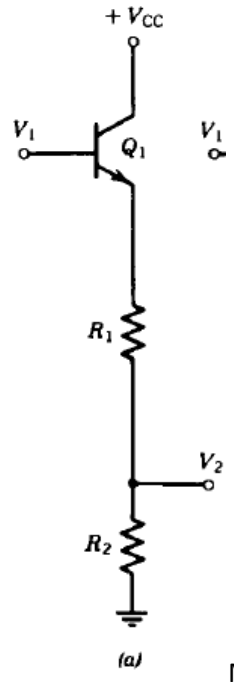
ECE3050 – Assignment 16

1. The figure shows a V_{BE} multiplier.



(d) For $V_T = 25\,\text{mV}$, $I_S = 7.5 \times 10^{-15}\,\text{A}$, $\beta = 99$, and $I = 5\,\text{mA}$, solve for R_1 and R_2 if $V = 2.4\,\text{V}$ and $I_1 = 0.1I$. Answers: $R_1 = 3.44\,\text{k}\Omega$, $R_2 = 1.49\,\text{k}\Omega$.

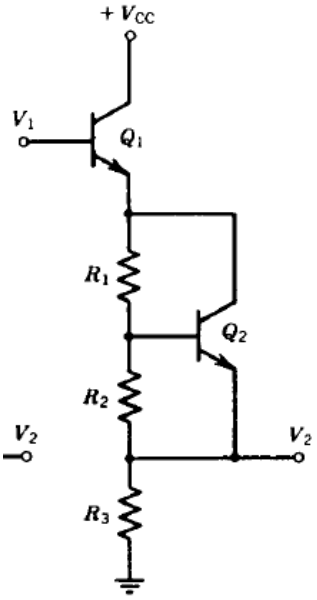
(e) Calculate the new values of R_1 and R_2 if the base current in the BJT is neglected. Answers: $R_1 = 3.44\,\text{k}\Omega$, $R_2 = 1.36\,\text{k}\Omega$.



(a)

Mostre que

$$V_2 = (V_1 - V_{BE})\frac{R_2}{R_2 + R_1} \qquad (4.62)$$



$$V_1 - V_2 = V_{BE}\left(2 + \frac{R_1}{R_2}\right)$$

Mostre que