

Übungsaufgabe 6.2

Folie 20 ff.: Übung 6.2

$$i) I_{C2} = \frac{U_B - U_{CE\text{Sat}2}}{R_2} = \frac{13,5V}{3,5\Omega} = \underline{\underline{3,86A}}$$

$$ii) I_{B2\text{min}} = \frac{I_{C2}}{\beta_2} = \frac{3,86A}{30} = \underline{\underline{0,129A}}$$

$$\ddot{u} = 10 \rightarrow I_{B2} = \underline{\underline{1,29A}}$$

$$U_{BE2} = U_{S2} + I_{B2} \cdot r_{BE2} = 0,6V + 1,29A \cdot 1\Omega = \underline{\underline{1,89V}}$$

(\rightarrow Ersatzschaltbild, Folie 9)

$$iii) U_{R2} = U_B - U_{BE2} = 14V - 1,89V = 12,11V, I_{R2} = I_{B2} = 1,29A$$

$$\rightarrow R_2 = \frac{12,11V}{1,29A} = \underline{\underline{9,4\Omega}}$$

$$iv) U_{CE\text{Sat}1} < U_{S2} \rightarrow \text{Strom fließt komplett durch } T_1$$

$$\rightarrow I_{B2} = \underline{\underline{\emptyset}} \rightarrow I_{C1} = \frac{U_B - U_{CE\text{Sat}1}}{R_2} = \frac{(14 - 0,4)V}{9,4\Omega} = \underline{\underline{1,447A}}$$

$$v) I_{B1\text{min}} = \frac{I_{C1}}{\beta_1} = \frac{1,447A}{50} = \underline{\underline{0,029A}}, \ddot{u} = 10 \rightarrow I_{B1} = \underline{\underline{0,29A}}$$

$$U_{BE1} = U_{S1} + I_{B1} \cdot r_{BE1} = 0,7V + 0,29A \cdot 3\Omega = \underline{\underline{1,57V}}$$

$$vi) U_{R1} = U_B - U_{BE1} = 14V - 1,57V = 12,43V, I_{R1} = I_{B1} = 0,29A$$

$$\rightarrow R_1 = \frac{U_{R1}}{I_{R1}} = \frac{12,43V}{0,29A} = \underline{\underline{43\Omega}}$$