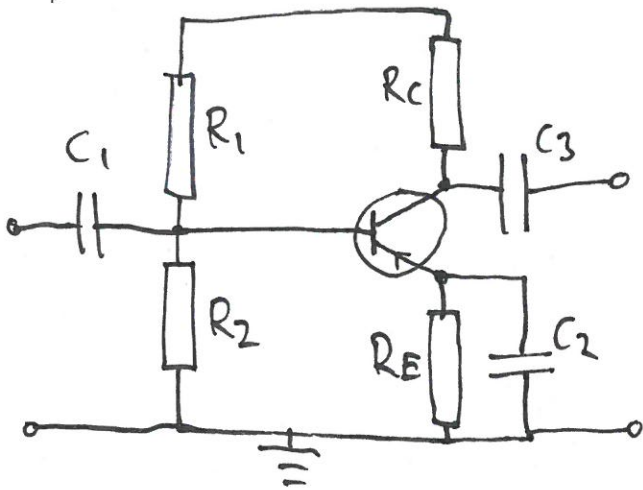


4.1)



$$E = -12 \text{ V}$$

$$R_1 = 47 \text{ k}\Omega$$

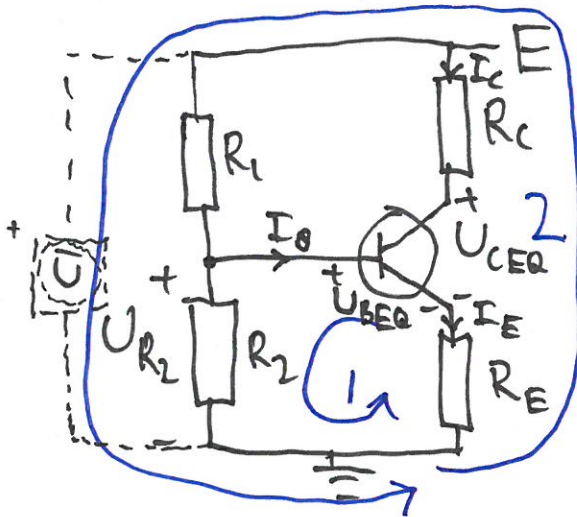
$$R_2 = 15 \text{ k}\Omega$$

$$R_B = 3,3 \text{ k}\Omega$$

$$R_E = 1 \text{ k}\Omega$$

$$U_{BEQ} = -0,7 \text{ V}$$

Likströmschema:



$$I_C = \beta \cdot I_B$$

$$\beta \text{ stor} \Rightarrow I_B \approx 0$$

$$\Rightarrow I_E = I_C$$

$$U_{R_2} = \frac{R_2 \cdot E}{R_1 + R_2}$$

$$1: -U_{R_2} + I_E \cdot R_E + U_{BEQ} = 0 \Rightarrow I_C = \left(U_{BEQ} - \frac{R_2 \cdot E}{R_1 + R_2} \right) / R_E = -2,2 \text{ mA}$$

$$2: -E + I_E \cdot R_E + U_{CEQ} + I_C \cdot R_C = 0$$

$$\Rightarrow U_{CEQ} = E - I_C \cdot (R_E + R_C) = -2,5 \text{ V}$$

$$I_C = -2,2 \text{ mA}$$

$$U_{CEQ} = -2,5 \text{ V}$$