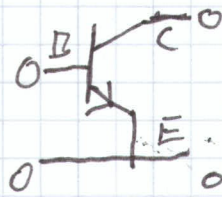
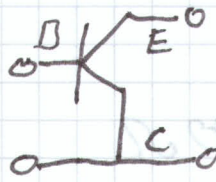


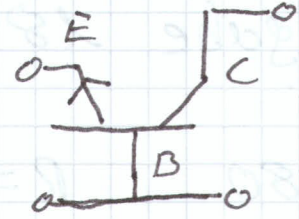
17)



Emitter



Kollektor



Basis

b)

Emitter: Signalverstärkung, Schalter

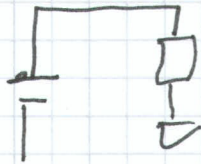
Kollektor: Piezo-Schallaufnahme, Impedanzwandler

Basis: Spannungsverstärker (hohe Frequenzen)
Erzeugen von Sinusschwingungen

18)

a) $G = \frac{R}{r_2} \geq 60 \Rightarrow R \geq 600 \Omega$

b) $U = \frac{U_0}{U_a} \geq 60 \Rightarrow \geq 240 V$



$U_0 = U_R + U_D \quad U_D = 4,5 V$

$= U_R + 4,5 V$

$= R \cdot \frac{4}{45} + 4,5 V$

$\approx 58 V \text{ für } 600 \Omega (?)$

$240 = R \cdot \frac{4}{45} + 4,5 \quad (\Rightarrow) \frac{240 - 4,5}{4,5} = R$

$U_R = I \cdot R$

$I = \frac{P}{U} = \frac{0,4}{4,5}$

d) $P = U_R I_R = 5,14 W (?) (600 \Omega)$

$= R \cdot \left(\frac{4}{45}\right)^2$

Aufgabe 18

$$\beta = 180 \quad R = 600 \, \Omega$$

$$\frac{I_C}{I_B} = \cancel{600} \cdot 180 = \beta \Rightarrow \frac{I_C}{\beta} = I_B$$

$$I_C = 2 \text{ A} \Rightarrow I_B = 11,1 \text{ mA}$$

$$I_{Z_{\min}} = 0,1 I_{Z_{\max}} \quad I_{Z_{\max}} = \frac{P_{\max}}{U_Z} = 88,9 \text{ mA}$$

$$I_{Z_{\min}} = 8,89 \text{ mA}$$

$$U_{O_{\min}} = R(I_{Z_{\min}} + I_B) + U_Z + r_Z I_{Z_{\min}} = 16,6 \text{ V}$$

$$\text{b) } U_{O_{\max}} = R(I_{Z_{\max}} + I_B) + U_Z + r_Z I_{Z_{\max}} = 65,4 \text{ V}$$

$$\text{c) } P_{\text{verlust}} = I_{\max} \cdot U_{CE, \max}$$

$$U_{CE} = U_{O_{\max}} - U_{CE} = (65,4 - 41) \text{ V} = 24,4 \text{ V} \Rightarrow P_{\text{verlust}} = 122,9 \text{ W}$$

$$\text{d) } P_R = U_R I_R = R I_R^2 \Rightarrow P_R = 6 \text{ W}$$

$$I_R = I_{Z_{\max}} + I_B$$