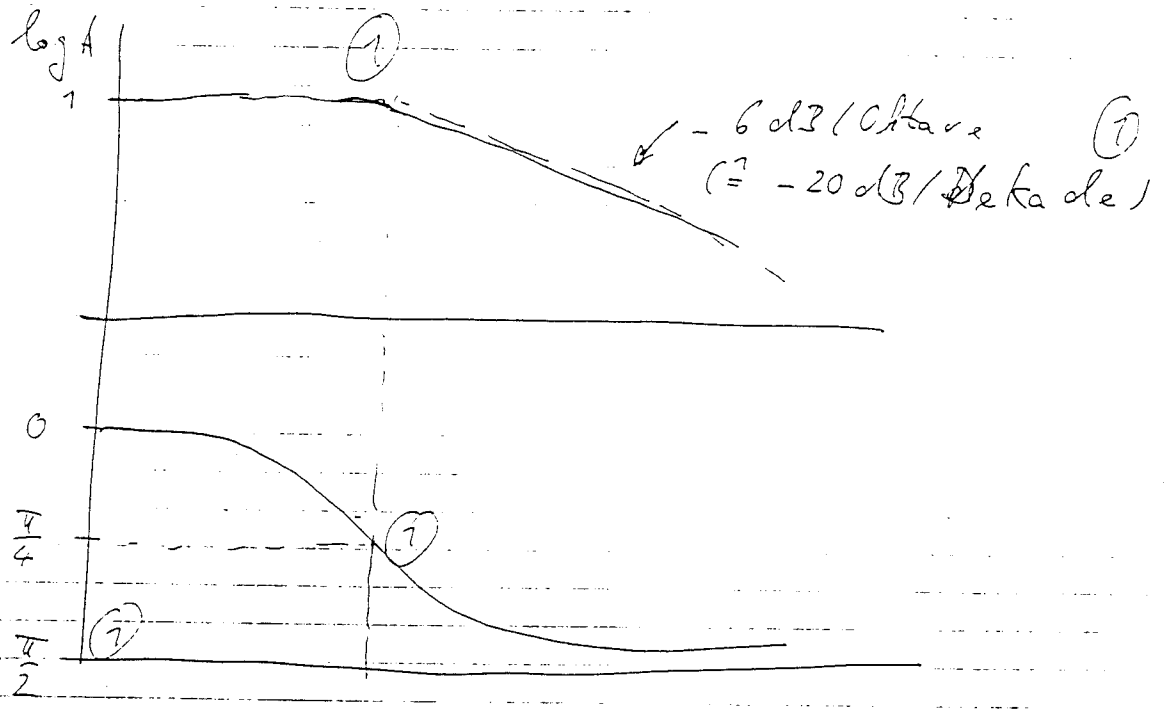
Klausur E-Praktikum 28.1.03

Aufgabe 1 (5) Punkte



$\omega_{-3dB} = \frac{1}{RC}$ (1)

Aufgabe 2

a) $U_E = 0 - 0{,}6V = -0{,}6V$ (1)

$I_{Bait} \approx 2mA$ (1)

$I_C = 1mA$ (1)

$U_a = 15V - R_C \cdot I_C = 7{,}5V$ (1)

2b) Potential an "A" bleibt für Gegentaktsign. konstant → R_{tail} spielt keine Rolle

effektiver Emitterwiderstand:

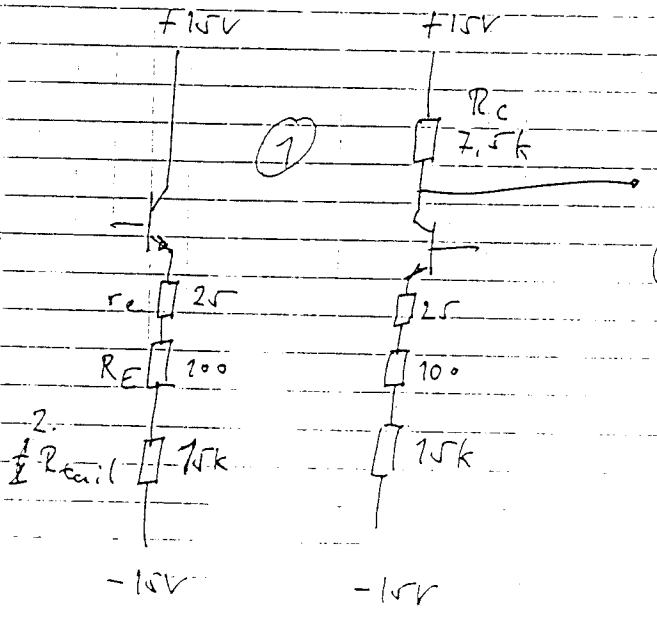
$$R_{E\,eff} = R_E + r_e$$

$$r_e = \frac{25\,\Omega}{I_C[mA]} = 25\,\Omega \quad (I_C = 1\,mA) \quad (1)$$

$$\rightarrow R_{E\,eff} = 100\,\Omega + 25\,\Omega = 125\,\Omega \quad (1)$$

$$G_{diff} = \frac{u_a}{u_e} = \frac{R_C}{2R_{E\,eff}} = \frac{7.5\,k}{2 \cdot 125\,\Omega} = 30 \quad (1)$$

2c) Gleichtaktströme in beiden Zweigen sind gleich, R_{tail} kann in 2 15k-Widerstände "zerschnitten" werden:



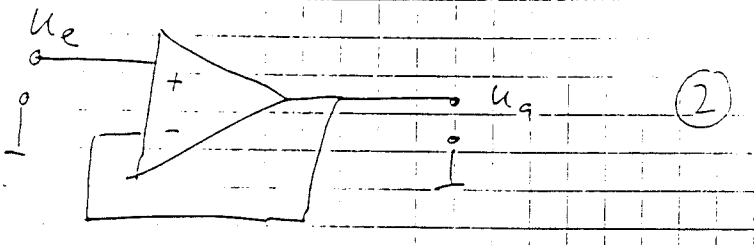
$$G_{diff} = \frac{7.5\,k}{25 + 100 + 15\,k} \approx 0.5 \quad (1)$$

2d) Stromquelle : $R_i = \infty$ statt $R_{ta:1}$

$$G_{d.ff} = \frac{Z \cdot \sigma k}{\infty} = 0 \quad (1)$$

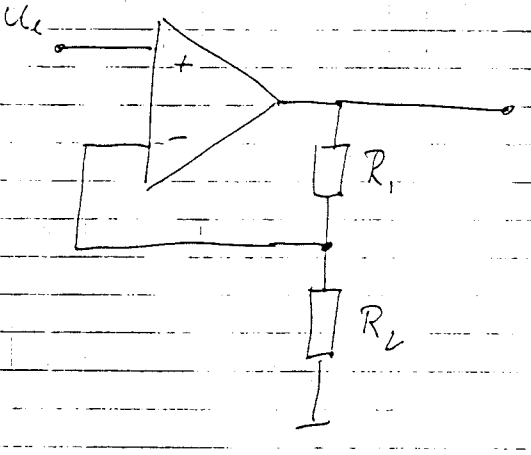
Aufgabe 3

a)



(2)

b)

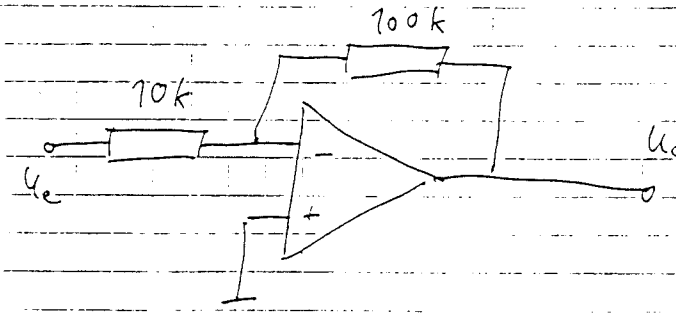


(2)

$$G_T = \frac{R_1}{R_2} + 1$$

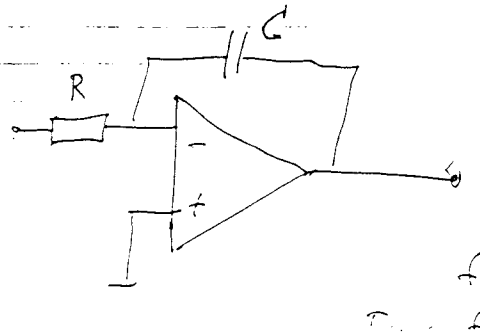
$$G_T = 10 \rightarrow \frac{R_1}{R_L} = 9$$

c)



(2)

d)



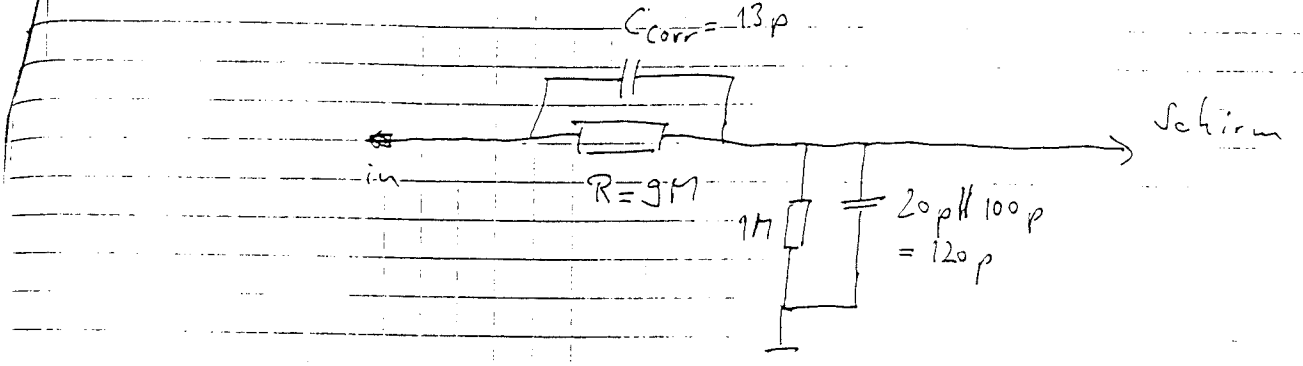
$\tau = RC = 1s$ (2)

Integrator invertiert.

falls jemand zusätzlichen

4. Aufgabe

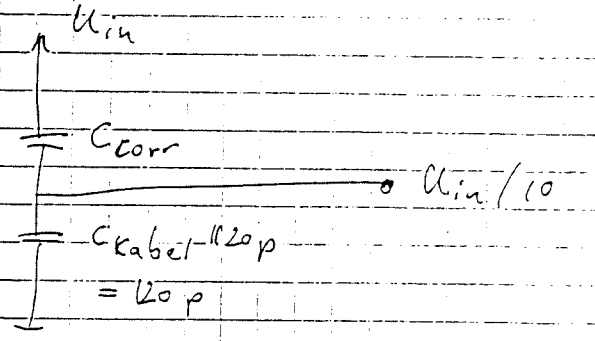
a)



a) $\frac{R + 1M}{1M} = \frac{10}{1}$ $\quad R = 9M$ (1)

b) Korrekturkondensator $C_{corr} \,//\, R$ (1)

Der kapazitive Spannungsteiler aus C_{corr} und $(C_{kabel} \,//\, 20p)$ muß auch 10 : 1 teilen:



$$\frac{\frac{1}{j\omega C_{corr}} + \frac{1}{j\omega \cdot 120p}}{\frac{1}{j\omega 120p}} = \frac{10}{1}$$

$$C_{corr} = \frac{120p}{9} = 13p \quad (1)$$

c) Eingangswiderstand : $R_{in} = 9M + 1M = 10M$ (1)

Eingangskapazität : $\frac{1}{C_{in}} = \frac{1}{13p} + \frac{1}{120p}$

$C_{in} = 12p$ (1)

d)	10 : 1	1 : 1	
R_{in}	10 M	1 M	(1)
C_{in}	12 p	120 p	