

### Pitanje

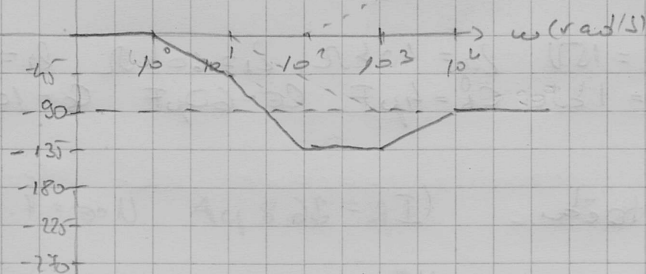
① Kolika je fazi poval prijenosne funkcije  $A(j\omega) = \frac{1 + j\omega}{(1 + \frac{j\omega}{\omega_1})(1 + \frac{j\omega}{\omega_2})}$

na frekvencijama  $\omega$  koje su znatno više od  $\omega_1, \omega_2, \omega_3$ ?

( $\omega_1 = 10^1, \omega_2 = 10^2, \omega_3 = 10^3$ )

faze:  $-90^\circ$

$A(10)$



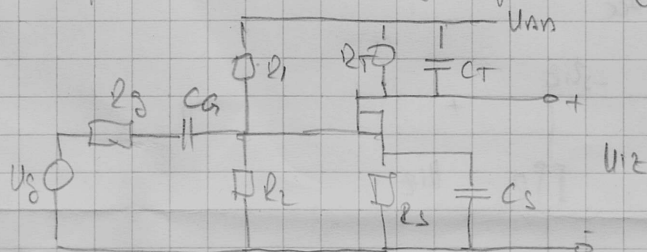
izvata nula unosi  $+90^\circ$  a svaki

pol  $-90^\circ$

$-90 - 90 + 90 = -90^\circ$

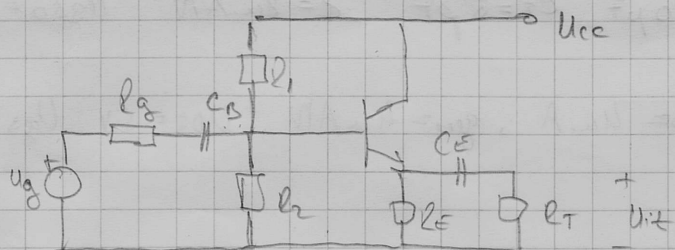
### Pitanje 1.

za pojačalo odrediti ovisnost amplitude pojačanja  $A_v(j\omega) = \frac{U_{iz}}{U_{ul}}$  u području niskih i srednjih frekvencija. Označiti utjecaj pojavnog kapaciteta



### Pitanje 3.

koje kapacitete u pojačalu treba razmatrati pri određivanju gornje granične frekv. od  $A_v = \frac{U_{iz}}{U_{ul}}$ . koji kapacitet dominira, obrazložiti.



### Pitanje 4.

Nacrtati shemu testnog pojačala s bipolarnim tranzistorima. Opisati svojstva tog pojačala.

### Zadatok 1.

$$A(j\omega) = -10^{12} \frac{(10 + j\omega)}{(10^2 + j\omega)(10^4 + j\omega)(10^5 + j\omega)}$$

a) amplitudnu (2.5 bodova)

b) fáznu (2.5 bodova)

$$A_0 = 40 \text{ dB } \angle -180^\circ$$

### Zadatok 2.

$$U_{CC} = 15 \text{ V} \quad R_g = 40 \text{ k}\Omega \quad R_1 = 60 \text{ k}\Omega \quad R_2 = 15 \text{ k}\Omega \quad R_E = 500 \Omega$$

$$R_C = 1.5 \text{ k}\Omega \quad R_T = 1 \text{ k}\Omega \quad C_g = 4 \mu\text{F} \quad C_E = 60 \mu\text{F} \quad C = 10 \text{ pF} \quad \beta = 100 \quad U_T = 0.7 \text{ V}$$

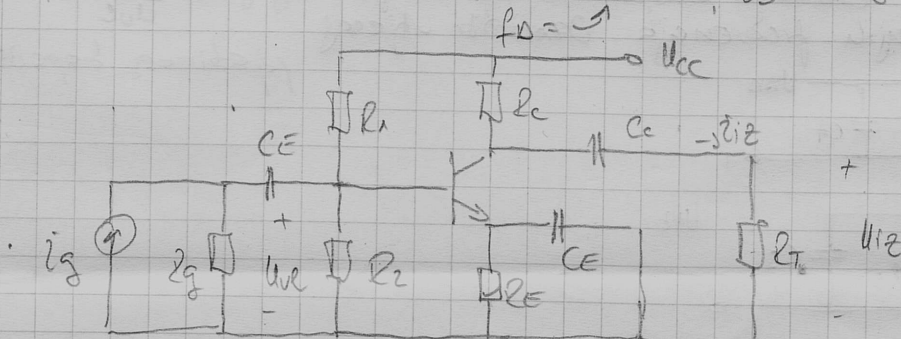
zmenenť r<sub>b'b</sub>.

a) statická pracovná bod (IR = 36.8 μA, U<sub>CE</sub> = 7.64 V) (1 bod)

b) nadozpiesna skema za NF (1 bod)

c) A<sub>ig</sub> na NF (-55.68) (1 bod)

d) f<sub>0</sub> = ? (f<sub>E</sub> = 32.34 Hz, f<sub>B</sub> = 0.98 Hz, f<sub>C</sub> = 7.96 kHz) (2 body)



### Zadatok 3.

$$U_{DD} = 15 \text{ V} \quad R_g = 5 \text{ k}\Omega \quad R_1 = 10 \text{ M}\Omega \quad R_2 = 5 \text{ M}\Omega \quad R_S = 500 \Omega$$

$$R_T = 2 \text{ k}\Omega \quad C_g = 200 \mu\text{F} \quad C_S = 20 \mu\text{F} \quad C_T = 5 \text{ pF} \quad \mu = 20 \text{ A/V}^2 \quad U_{GS0} = 1 \text{ V}$$

$$C_{gs} = 2.5 \text{ pF} \quad C_{gd} = 1.5 \text{ pF}$$

a) statická pracovná bod (I<sub>D</sub> = 4 μA, g<sub>m</sub> = 4 μA/V, U<sub>DS</sub> = 5 V, U<sub>GS</sub> = 3 V) (1 bod)

b) nadozpiesna skema (1 bod)

c) A<sub>vq</sub> na svodnjim (A<sub>vq</sub> = -7.988, f<sub>UL</sub> = 2.38 kHz, f<sub>U2</sub> = 11.835 MHz) (3 body)

