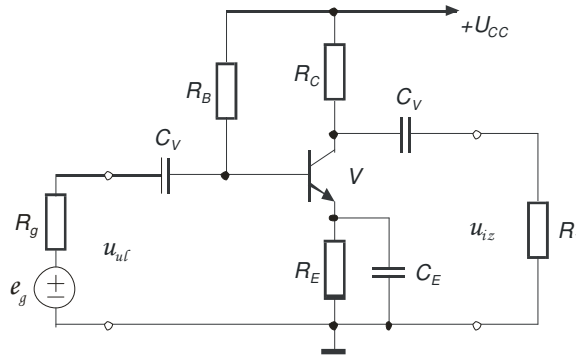


2. domaća zadaća iz Analognih sklopova i Elektroničkih sklopova

1. U pojačalu sa slike zadano je: $U_{CC} = 9 \text{ V}$, $R_B = 150 \text{ k}\Omega$, $R_C = 470 \text{ }\Omega$, $R_E = 150 \text{ }\Omega$, $\beta = h_{fe} = 160$, $R_T = 1 \text{ k}\Omega$, $R_g = 600 \text{ }\Omega$, $e_g = 30\sin\omega t$, mV. Izračunajte izlazni napon u_{iz} te snagu tranzistora s priključenim ulaznim signalom i bez njega.

**Rješenje:**

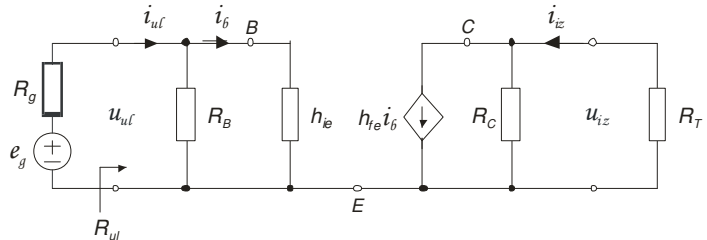
$$I_{BQ} = \frac{U_{CC} - U_{BEQ}}{R_B + (1 + \beta)R_E} = 47,66 \text{ }\mu\text{A}, \quad I_{CQ} = \beta I_{BQ} = 7,626 \text{ mA}$$

$$U_{CEQ} = U_{CC} - (R_C + R_E) \cdot I_{CQ} = 4,272 \text{ V}$$

$$h_{ie} = \frac{mU_T}{I_{BQ}} \approx \frac{0,025}{I_{BQ}} = 524,5 \text{ }\Omega$$

$$A_V = -\frac{h_{fe} \cdot R_C \parallel R_T}{h_{ie}} = -97,52$$

$$R_{ul} = R_B \parallel h_{ie} = 522,7 \text{ }\Omega$$

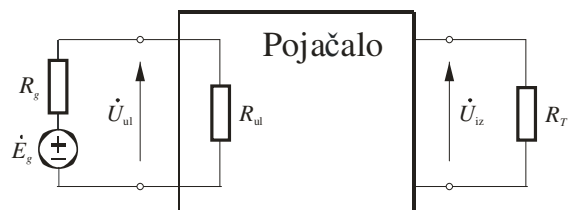


$$\dot{U}_{iz} = A_V \cdot \dot{U}_{ul} = A_V \cdot \frac{R_{ul}}{R_{ul} + R_g} \cdot \dot{E}_g =$$

$$\dot{U}_{iz} = 45,41 \cdot \dot{E}_g \quad \boxed{u_{iz} = -1,362 \sin \omega t, \text{ V}}$$

$$u_{ce} = u_{iz}$$

$$i_c = -\frac{u_{ce}}{R_C \parallel R_T} = 4,260 \sin \omega t, \text{ mA}$$



Snaga tranzistora	
Bez priključenog ulaznog signala	S priključenim ulaznim signalom
$P_V = P_{VDC} = U_{CEQ} \cdot I_{CQ} = 32,58 \text{ mW}$	$P_V = P_{VDC} + P_{VAC} = U_{CEQ} \cdot I_{CQ} - \frac{U_{cem} \cdot I_{cm}}{2} = 29,68 \text{ mW}$