PP ... tols thvistes ... IAU

$\beta = 400$, $I_A = 2$, $I = 10$, $V_{BE} = 0.6V$

$-V_{CC} + I_{C1}(R_{C1} + R_1) + V_{BE1} = 0$

$I_{C1} = \dfrac{12 - 0.6}{R_1 + R_{C1}} = \dfrac{11.4}{6100} \cong 1.35\ mA$

$I_{C1} \cong 1.35\ mA$

G_1, G_2 ... de courant $\to I_{C2} = 1.35\ mA$

$-V_{CC} + V_{EB1} + I_{B1}R_1 + I_{C1}R_3 = 0$

$\dfrac{V_{CC} - V_{EB1} - I_{C1}R_3}{R_1} = I_1 \cong 1.36\ mA \quad (\Rightarrow \dfrac{12 - 3.6 - 1.35\cdot10^{?}}{9.00})$

$\left.\begin{array}{l} I_{B1} = \dfrac{I_{C1}}{\beta} \\[2mm] I_{B2} = \dfrac{I_{C2}}{\beta} \end{array}\right\} \to I_{B1} = I_{B2} = \dfrac{1.36\cdot10^{-3}}{400} \cong 3\ \mu A$ |... mco... Bande β!

$I_{C1} = I_{C2} = 1.36\ mA$

$I_{B3} = I_{B1} + I_{B2} + (I_1 - I_{C1})$

$I_{B3} =$

$-V_{CC} + I_{C3}R_{100} + V_{EB} + I_{R1} = 0$

$\dfrac{V_{CC} - V_{EB} - I_{R1}}{R_{100}} = I_{C3} \cong 1.52\ mA$

$I_{C3} = I_{B8}$

$I_{C8} = I_{B5}\ \beta = 1.52\cdot200\cdot10^{-3} \cong 3.00\ mA$

$I_{C5} = I_{B4} \Rightarrow I_{C4} = I_{B4} = \dfrac{I_{C3}}{2} = \dfrac{1.36}{2} = 0.68\ mA$

$I_{C8} = I_{C7} \cong ... mA$

$-V_{CC} + I_{c4}(R_4 + R_3) + V_{EC_1} = 0$

$V_{CC} - I_{c1}(R_1 + R_2) - V_{EC_1} \cong 9,68V$

$V_{EB_1} + V_{BC_1} + V_{CE_1} = 0$

$V_{BC} = 0$

$V_{CB_1} = -V_{EB} = -0,6V \Rightarrow V_{EC} \cong 0,6V$

$I_{c4}(R_4 + R_3) - V_{BE_4} + V_{EC_4} + I_{c4}(R_2) - V_{EB} = 0$

$V_{EC_4} + I_{c4}(R_4 + R_3) + V_{BE_4} - I_{c4}(R_2) - V_{EC_4} = 8,52V$

$I_{c4}R_2 - V_{EC_4} + V_{EC_5} = 0$

$V_{EC_5} = V_{EC_4} - I_{c4}R_2 = 7,5V$

$=$

$I_{c5} = I_{c6} = 0,68mA$

$V_{EC_2} = V_{CC} - I_{c2}R_6 - V_{EB_4} - I_{B5}R_5$

$= 10 - 1,35 \cdot 10^{-3} \cdot 100 - 0,6 \cdots 20 \cdot 10^{3}$

$\cong 9,26V$

$V_{EC_3} = V_{BC_3} - I_{B5}$

$-V_{CC} + I_{E_3}R_{100} + V_{EC_3} + V_{BC_3} + I_B(R_4 + R_3) = 0$

$V_{EC_3} = V_{CC} - I_{E_3}R_{100} - V_{BE_8} - I_B(R_4 + R_3) \cong 9,2 V$

$V_{EC_8} \cong V_{EC_7} \text{ wtug de diodo} \Rightarrow V_{EC_8} \cong V_{EC_7} = 0,6V$

Amplificator în buclă deschisă

$av = a_1 \cdot a_2 \cdot a_3$

etaj de   etaj de   etaj de G_2
v_4 v_6

$a_1 = -g_{m4}(R_7 \| R_8)$

$a_1 = -40 \bar{I}_{c4}\left(150 \cdot 9 \| \dfrac{335}{40 I_{c8}}\right) = -40 \cdot 0.372 \cdot 10^{?}$

$a_1 = -15,42$

$a_2 = -g_{m6}(R_{?6} \| ?d_{03})$

$a_2 = -40 I_{c6}\left(\dfrac{V_A}{I_{c6}} \| \dfrac{V_A}{I_{c3}}\right)$

$I_{c6} = I_{c3}$

$a_2 = -40 I_{c6}\left(\dfrac{V_A}{2 I_{c6}}\right)$

$a_2 = -620$

$a_3 = 1 - $ etaj colector comun

$av = -15,42(-620 \cdot 1)$

$av = 9.560$

Rez de intrare

$R_{in} = r_{\pi 4} = \dfrac{\beta}{g_{m4}} = \dfrac{385}{1,0 \cdot 0,372 \cdot 10^{-3}}$

$R_{in} \simeq 20,7 \, k\Omega$

Rez de iesire

$R_O = \dfrac{1}{g_{m7}} = \dfrac{1}{40 I_{c7}} \simeq 3,29 \, \Omega$