

Aluno (a): Luis Fritze de Lima Sales
Aluno (a): LEONARDO CAMPELO DA COSTA

Pode consultar seus apontamentos
Término: 15 horas (sem prorrogação)

8º

Faça o que se pede:

a- Calcular R_1 e R_C .

b- Calcular a corrente de saturação e a tensão de corte do circuito.

c- Calcular V_{RL} .

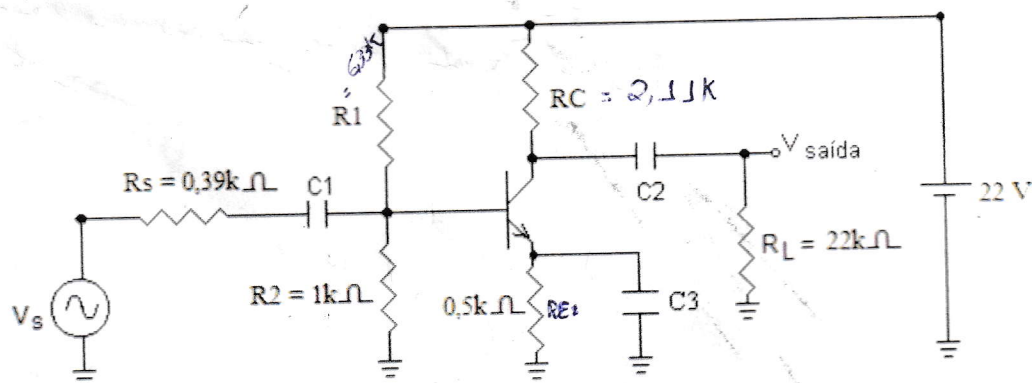
d- Calcular C_1 , C_2 e C_3 na frequência do sinal do gerador V_s .

e- Suponha que o resistor R_2 foi retirado do circuito. Calcular a nova corrente que passa no emissor do transistor e explicar o novo comportamento do circuito.

Considerar: $V_{CE} = 10\text{ V}$; $V_{R2} = 3\text{ V}$; $V_{BE} = 0,7\text{ V}$; $I_C \gg I_B$; $I_C \approx I_E$; $I_{R1} \approx I_{R2}$;

$\beta_{CC} = \beta_{ca} = 100$

$V_s = 15 \text{ sen}(500\pi t) \text{ mV}$



$$I_C = I_E = \frac{V_E}{500}$$

$$I_C = I_E = 4,6 \text{ mA}$$

LUIS RIZIPE de LIMA SALES
LEONARDO CAMPELO DA COSTA

$$V_{R2} = \frac{R_2 \cdot V_{CC}}{R_1 + R_2} \Rightarrow 3 = \frac{1000 \cdot 22}{1000 + R_1} \Rightarrow R_1 = 6,33 \text{ K}$$

$$V_E = 3 - 0,7$$

$$V_E = 2,3 \text{ V}$$

$$\frac{23}{500} = \frac{12}{500 + R_E}$$

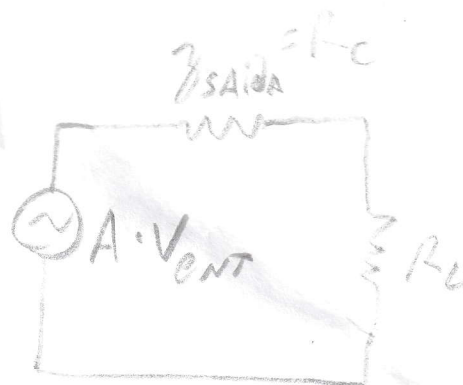
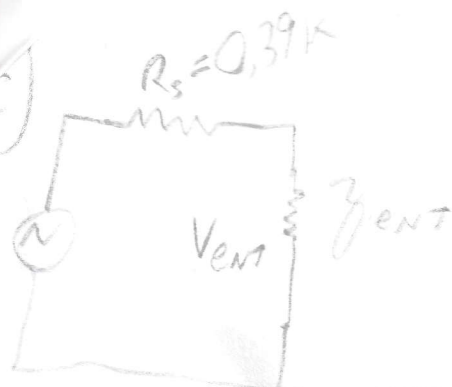
$$R_E = 2108,7 \, \Omega$$

$$I_C = \frac{V_{CC} - V_{CE}}{R_C + R_E}$$

b)

$$I_{(sat)} = \frac{22}{2110 + 500} = 0,0084 = 8,4 \text{ mA}$$

$$V_{C_{ORTE}} = V_{CC} = 22 \text{ V}$$



$$r_d = \frac{25 \cdot 10^{-3}}{4,6 \cdot 10^{-3}} = 5,43 \Omega$$

$$A = -\frac{R_c}{r_d}$$

$$Z_{ent} = \beta_{FA} \cdot r_d = 543 \Omega$$

$$V_{RL} = \frac{R_c \cdot A \cdot V_{ent}}{R_L + R_c}$$

$$Z_{ent} = 6,33 k \parallel 1 k \parallel 543$$

$$= 863 \parallel 543 = 333,3 \Omega$$

$$V_{ent} = \frac{15 \cdot 333,3}{390 + 333,3} = 6,91 mV$$

$$A = -\frac{2200}{5,43} = -388$$

$$V_{RL} = \frac{22000 \cdot (-388) \cdot 6,91 \cdot 10^{-3}}{22000 + 2200} = -2,44 V$$

d) C_g :

$$R_{eq} = R_s + Z_{ent} = 390 + 333 = 723$$

$$X_{C_g} = 0,1 \cdot 723 = 72,3$$

$$C_g = \frac{1}{2\pi \cdot 250 \cdot 72,3} = 8,8 \mu F$$

Luis Filipe de Lima SACS
LEONARDO CAMPELO da COSTA

$C_2 =$

$$R_{e2} = \beta_{AIDA} + \beta_{INT}$$

$$= 2110 + 22000$$

$$= 24110$$

$$1_{C2} = 24110 \cdot 0,1 = 2411$$

$$G_2 = \frac{1}{2\pi \cdot 250 \cdot 2411} = 2,69 \cdot 10^{-7} F$$

$C_3 =$

$$R_{TH} = 2 \cdot 1152 \parallel 1152$$

$$= 390 \parallel 863 = 268,65 \Omega$$

$$\frac{R_{TH}}{\beta_{AIDA}} = \frac{268}{100} = 2,68$$

$$R_{eq3} = 2,68 + R_d = 2,68 + 5,43 = 8,11$$

$$\beta = \frac{1}{2\pi \cdot 0,2 \cdot 8,11 \cdot 250} = 7,89 \cdot 10^{-4}$$

$$e) -22 + 6330 \cdot i + 10 + 570 \cdot i = 0$$

$$i_E = 3,75 \text{ mA}$$

~~I_{SSO} resultado~~

$I_E = 37,83 \text{ mA}$
Transistor saturado!