Tarea 5

Angie Marchena Mondell

16.

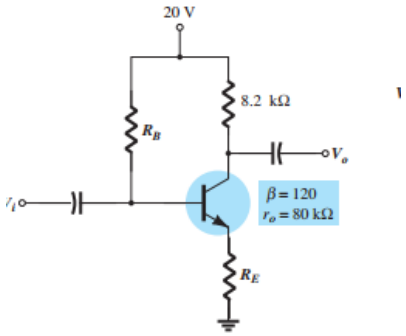
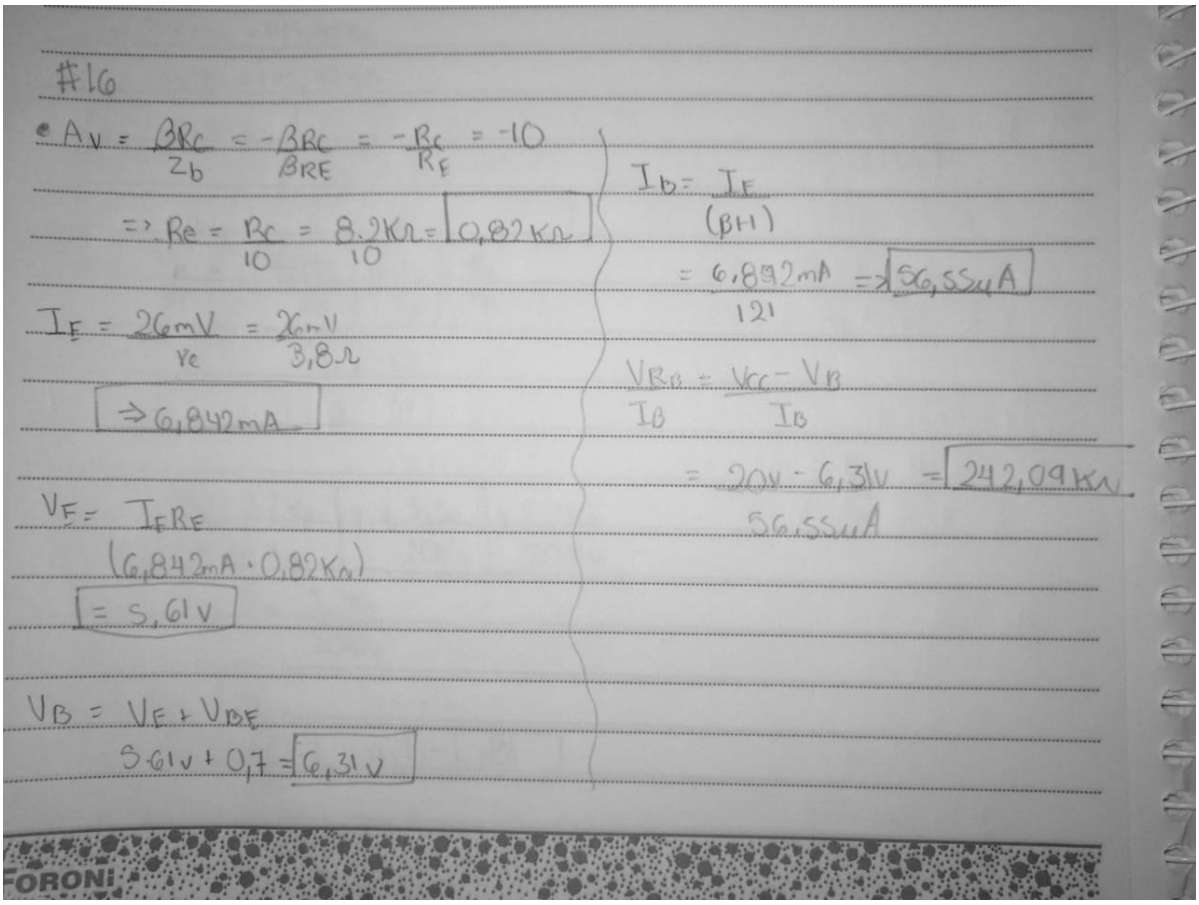


FIG. 5.157
Problema 16.



Tarea 5

17.

17 #17

a) $r_e = 5,34\Omega$ (#15)

b) $Z = R_B // Z_b$

$Z_i = R_B // \beta r_e$

$= 390K\Omega // (140 \cdot 5,34\Omega)$

$= 746,17\Omega$

$Z_o = R_C = 2,2K\Omega$

c) $A_V = \frac{-R_C}{r_e} = \frac{-2,2K\Omega}{5,34\Omega}$

$A_V = -411,99$

d) $Z_i = 746,17$

$Z_o = R_C // r_o$

$= \frac{2,2K \cdot 20K}{2,2K + 20K} = 1,98K\Omega$

$A_V = \frac{R_C // r_o}{r_e}$

$= \frac{1,98K\Omega}{5,34\Omega} = -370,79$

18.

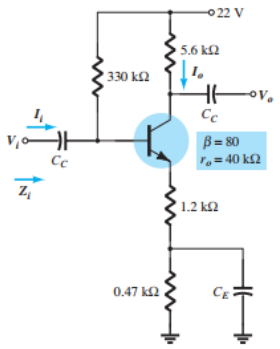


FIG. 5.158
Problema 18.

Tarea 5

#18

a) $I_B = \frac{V_{CC} - V_{BE}}{R_B + (\beta+1)R_E}$

$= \frac{22V - 0,7}{330K\Omega + (81)(1,2K\Omega + 0,47K\Omega)}$

$= 45,78\mu A$

b $r_o < 10(R_C + R_E)$

$Z_b = \beta r_e + \left[\frac{(\beta+1) + R_C / r_o}{1 + (R_C + R_E)/r_o}\right] R_E$

$= (80 \cdot 7\Omega) + \left[\frac{81 + 5,6K / 40K\Omega}{1 + (6,8K) / 40K\Omega}\right] \cdot 1,2K\Omega$

$= 560\Omega + \left[\frac{81 + 0,14}{1 + 0,17}\right] 1,2K\Omega$

$= 560\Omega + [81,14 / 1,17] \cdot 1,2K$

$= 87,78K\Omega$

$Z_i = R_B // Z_b$

$= \frac{330K \cdot 83,78K}{330K + 83,78K}$

$= 66,82K\Omega$

$A_V = \frac{-\beta R_C}{Z_D} \cdot \frac{\left(1 + \frac{r_e}{r_o}\right) + \frac{R_E}{r_o}}{1 + \frac{R_C}{r_o}}$

$\Rightarrow \frac{-80 \cdot 5,6K\Omega}{83,78K\Omega} \cdot \frac{\left(1 + \frac{7\Omega}{40K\Omega}\right) + \frac{5,6K\Omega}{40K\Omega}}{1 + 5.6K\Omega / 40K\Omega}$

$\Rightarrow \frac{-(5,35) + 0,14}{1 + 0,14}$

$\Rightarrow -4,57$

Tarea 5

22.

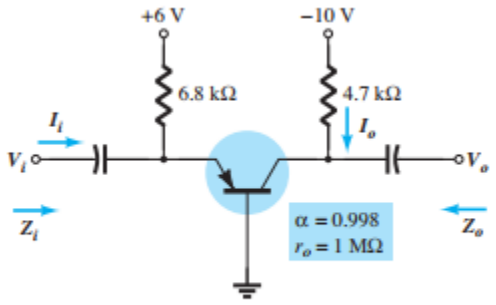


FIG. 5.162
Problema 22.

#22

a) $I_E = \frac{V_{EE} - V_{BE}}{R_E}$

$= \frac{6V - 0,7V}{6,8K\Omega} = 0,779mA$

$r_e = \frac{26mV}{I_E}$

$= \frac{26mV}{0,779mA} = 33,38\Omega$

b) $Z_i = R_E // r_e$

$\frac{6,8K\Omega \cdot 33,38\Omega}{6,8K\Omega + 33,38\Omega}$

$= 33,22\Omega$

$Z_o = R_C = 4,7K\Omega$

c) $A_V = \frac{\alpha R_C}{r_e} = \frac{(0,998 \cdot 4,7K\Omega)}{33,38\Omega}$

$= 140,52$