Reconozco que el presente taller está diseñado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copias. Firmo en señal de compromiso, como constancia de haber leído y aceptado la declaración anterior.

Alexandra Barreto B.

46/100

Tema (1).

a) La expresión lógica minimizada

$$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$$

$$\bar{B}C\bar{E}(\bar{A}+A)^{=1} + BC\bar{D}E(\bar{A}+A)^{=1} + E$$

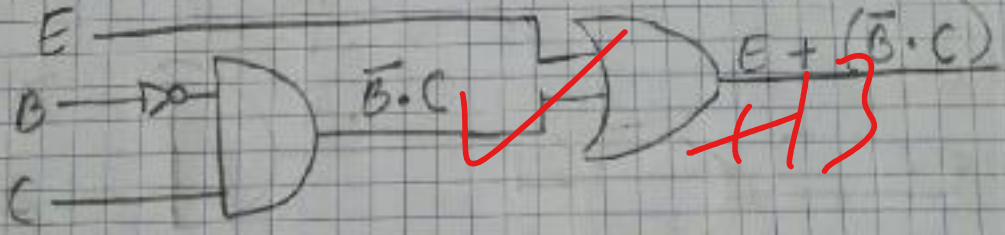
$$\bar{B}C\bar{E} + BC\bar{D}E + E$$

$$\bar{B}C\bar{E} + E(BC\bar{D}+1)^{=1}$$

$$\underline{\bar{B}C\bar{E}} + \underline{E} = E + (\bar{B}C)$$

+20

b)



+13

Teoria 2

a) Determinar los valores de R, C para q' exista un retardo de 10 ms.

$T = 2\pi = 360° = 16.66\ ms$

$360° \rightarrow 16.66\ ms$

$? \rightarrow 10\ ms$

$\alpha = 216.08°$

$V_p = V_D + \eta V_{BE}$

$V_p = 0.5V + 0.7 \times 28V$

$\boxed{V_p = 20.1V}$

$\frac{V_{BB} - V_V}{I_V} = \frac{28 - 2}{3m} = 8.66\ k\Omega < R$

$\frac{V_{BB} - V_p}{I_p} = \frac{28 - 20.1}{5\mu} = 1.6\ M\Omega > R$

$\boxed{8.66k\Omega < R < 1.6\ M\Omega}$

$t_{descarga} << t_{carga}$

$T = t_{descarga}$

$R_1 = 100k\Omega$ → Porque?

$t_{carga} = R_1 \cdot C \cdot \ln\left(\frac{V - V_V}{V - V_p}\right)$

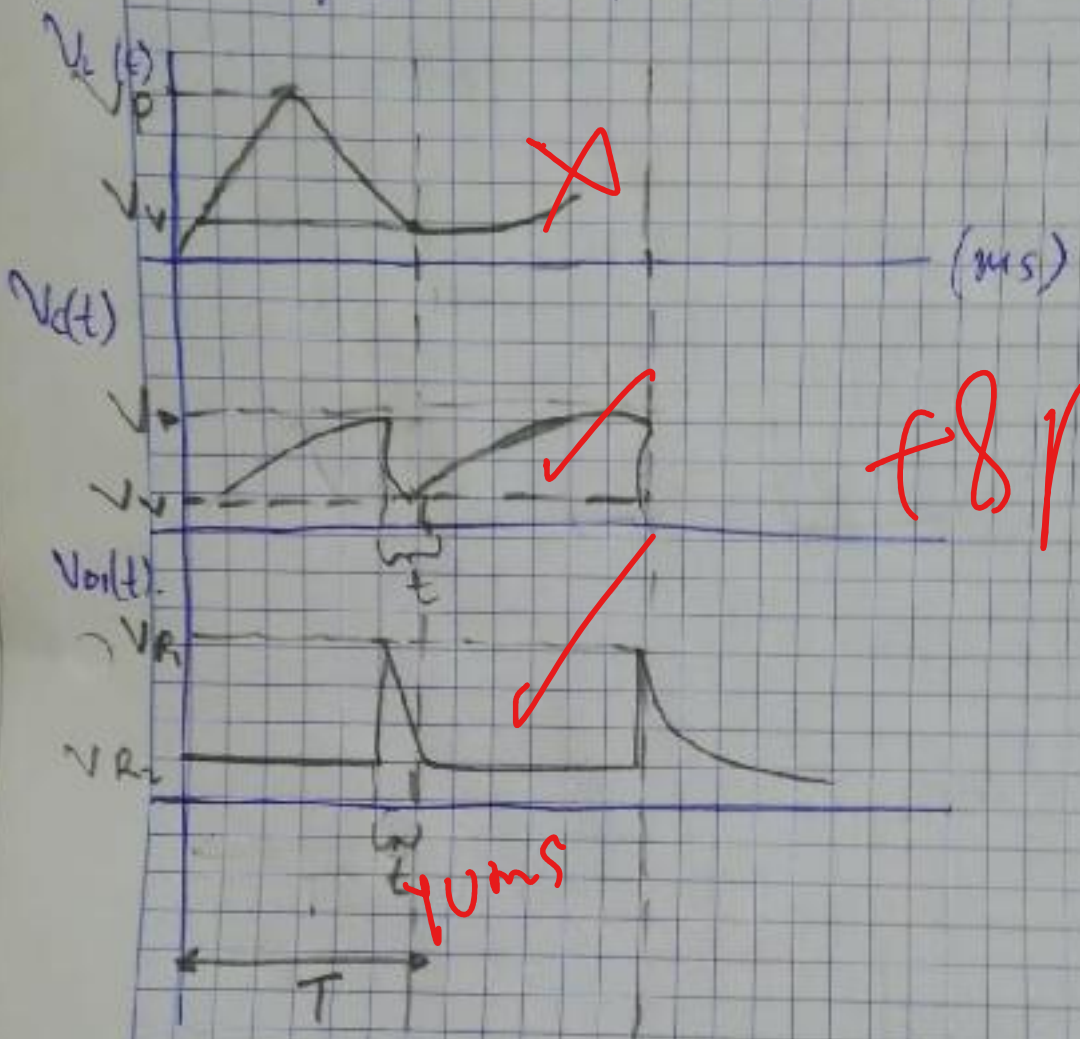
$10ms = 100k\Omega \cdot C \cdot \ln\left(\frac{28 - 2}{28 - 20.1}\right)$

$\boxed{C = 0.08\mu F}$

F15P.

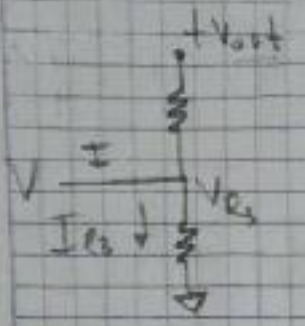
Tema 2

b) Graficar $V_L(t)$, $V_C(t)$, $V_{D1}(t)$.



f8p

Tema 3



$I \approx 0$

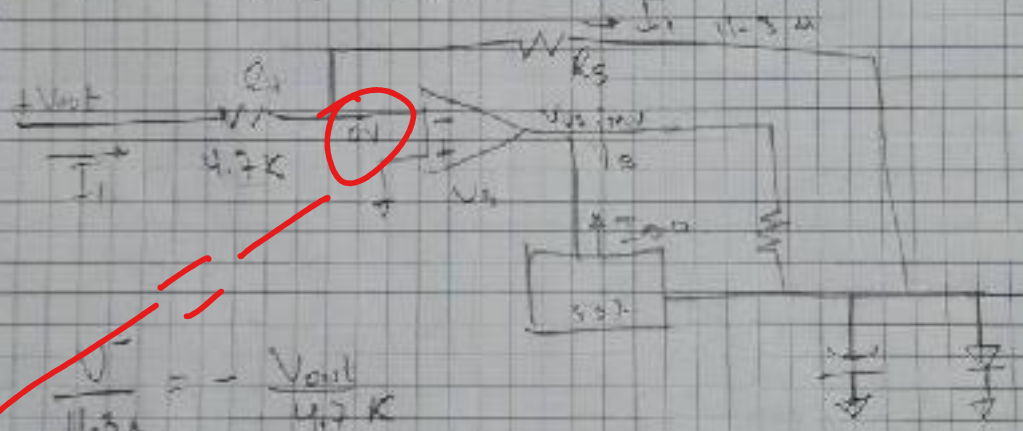
$I_{R3} = \frac{1.25}{120} = 10.42\ mA$ ✓ +4p

$V_{R3} = I_{R3}(300)$ ✓ +4p

$V_{R3} = (10.42 \times 10^{-3})(300) = 3.16V$ ✓

$V_{out} = 1.25 + V_{R3} = 1.25 + 3.16$ +4p

$V_{out} = 5.21\ V$



$\frac{V^-}{11.3A} = -\frac{V_{out}}{4.7K}$

$V^- = -\frac{V_{out}}{4.7K}(11.3) = -14.14\ V$

$V_{out\ inv} = V_o = 1.25 + V^- = -0.19\ V$ ✗

$I_{R4} = I_{R5} = I' = \frac{V_{out}}{4.7} = \frac{5.21}{4.7K} = 1.10\ mA$ ✓ +4p

+4p

a)

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{F} + ABC\bar{D}E + E$

~~$\bar{B}C\bar{E}(\bar{A}+A) + E(\bar{A}BC\bar{D} + ABC\bar{D} + 1)$~~

$\bar{A}\bar{B}C\bar{E} + (\bar{A}BC\bar{D}E + F) + A\bar{B}CF + ABC\bar{D}E$

$\bar{A}BC\bar{E} + ABC\bar{E} + E(\bar{A}BC\bar{D} + 1 + ABC\bar{D})$

$E + \bar{E}(\bar{A}BC \vee ABC)$

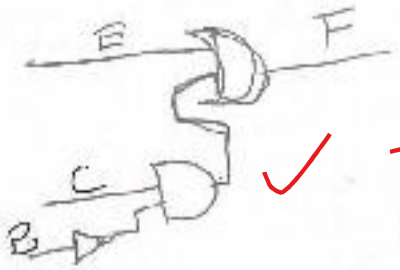
$E + \bar{A}\bar{B}C + A\bar{B}C$

$E + \bar{B}C(\bar{A}+A)$ +20p

$E + \bar{B}C$

64/100

b)



+13p

Nombre Luis Camacho

Compromiso de Honor

Tema 2

a) $V_p = V_D + \eta \cdot V_{BB}$

$V_p = 0,5V + 0,7 \cdot (12V)$

$V_p = 20,1V$

$$\frac{V_{BB} - V_V}{I_V} = R < \frac{V_{BB} - V_p}{I_p}$$

$3,66K\Omega < R < 1,10 M\Omega$

$T = t_{OFF}$

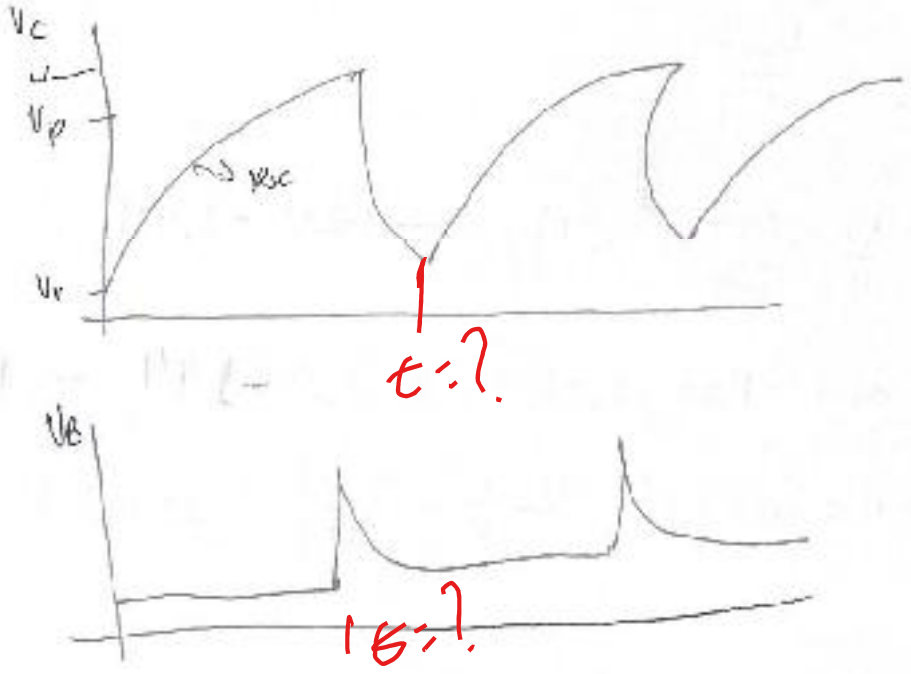
$R = 100K\Omega$ → porque? ✓

$t_{ON} = R \cdot C \cdot \ln\left(\frac{V_{BB} - V_V}{V_{BB} - V_p}\right)$

$t_{ON} = 100K\Omega \cdot (C) \cdot \ln\left(\frac{28 - 0}{28 - 20,1}\right)$

$C = 0,09\mu F$

b)



3) LM317

$I = 0V$ ✓ +4p

$I_{R3} = \frac{1,25}{120} = 10,42\,mA$ ✓

$V_{R1} = I_{R1}(380)$

$V_{R1} = (10,42 \times 10^{-3})(380) = 3,96V$ ✓ +4p

$V_{out} = 1,25 + V_{R3}$ +4p

$V_{out} = 1,25 + 3,96$

$V_{out} = 5,21V$ ✓

Opamps

$\frac{V^-}{1,3} = \frac{V_{out}}{4,7}$

$V^- = \frac{1,3}{4,7}(V_{out})$

$V^- = \frac{1,3}{4,7}(5,21)$

$V^- = 1,44$ ✗ ✓

Lodebe ser negativo

$V_{VS.NV} = V_B = 1,25 + V^- = 1,25 - 1,44 = -0,19V$ ✗ ✓

$I_{R4} = I_{R5} = I' = \frac{V_{out}}{4,7} = \frac{5,21}{4,7} = 11,09\,mA$ +4p ✓

Facultad de Ingeniería en Electricidad y Computación

Examen Final de Electrónica EYAG1034:

2do TÉRMINO 2021-2022

Nombre: Edwin Chávez **Paralelo:** ____ **Fecha: 25 de enero, 2022**

CAc-2013-108.-Compromiso ético de los estudiantes al momento de realizar un examen escrito de la ESPOL

COMPROMISO DE HONOR

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Firma de Compromiso del Estudiante

Nota: La copia ameritará la nota de cero.

1T / 33	
2T / 35	
3T / 32	
Total / 100	

95/100

PRIMER TEMA (33 PUNTOS)

En el siguiente problema, reducir la siguiente expresión lógica usando Algebra de Boole:

$$\bar{A}BC\bar{E} + \bar{A}BCDE + A\bar{B}C\bar{E} + ABCDE + E$$

Presentar:

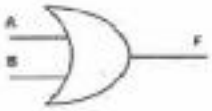
a) La expresión lógica minimizada. (20 p)

b) Implemente la expresión mínima encontrada en el literal a usando una única compuerta OR, AND y NOT. (13 p)

Hint:

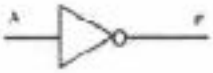
F = A and B

F = A. B



F = A or B

F = A+B



F = not (A)

F = $\bar{A}$

$\bar{A}B\bar{C}\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$\bar{A}B\bar{C}\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + E(ABC\bar{D} + 1)$

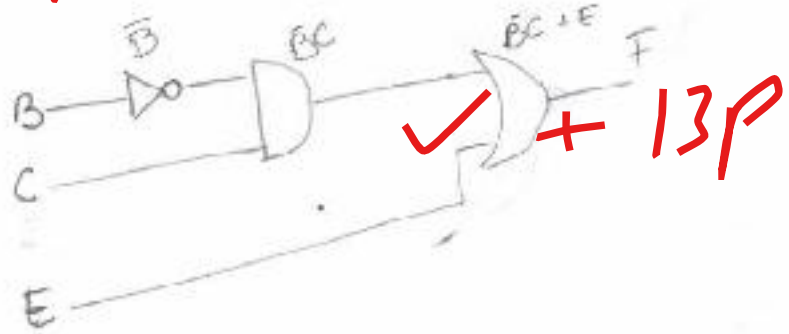
$= \bar{A}B\bar{C}\bar{E} + A\bar{B}C\bar{E} + E(\bar{A}BC\bar{D} + 1)$

$= B C\bar{E}(\bar{A} + A) + E$

$= B C\bar{E} + E$

$= BC + E$

+20p



+13p

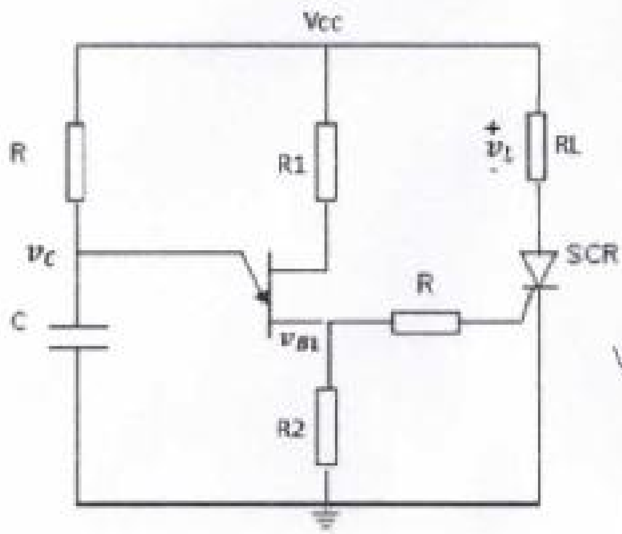
SEGUNDO TEMA (35 PUNTOS)

Considerando que el circuito debe oscilar:

a) Determinar los valores de R, C para que exista un retardo de 10ms. (20 p)

b) Graficar las señales de $v_L(t)$, $v_C(t)$, $v_{B1}(t)$. (15 p)

Datos: $\eta = 0.7, R_{BB} = 6[K\Omega], V_D = 0.5[V], I_P = 5[\mu A], I_V = 3[mA], V_V = 2[V], R_{B1(on)} = 100[\Omega]$.
$Vcc = 28V, \quad R1 = 100[\Omega], \quad R2 = 47[\Omega], \quad RL = 10[\Omega]$.



$$\eta = \frac{R_{B1}}{R_{B1} + R_{B2}}$$

$$0.7 = \frac{R_{B1}}{R_{BB}}$$

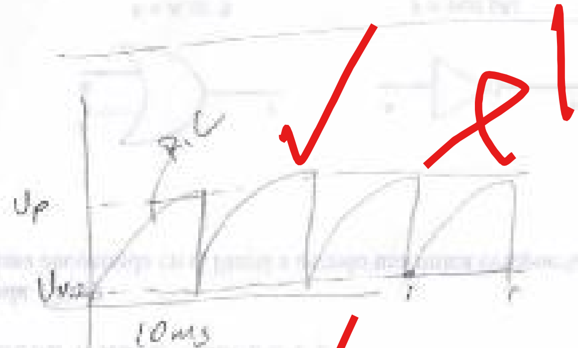
$$R_{B1} = 4.2\,K\Omega$$

$$V_P = 0.7 + \frac{(R_{B1} + R_2)\,28}{\underbrace{R_{B1} + R_{B2}}_{R_B} + R_2}$$

$$V_P = 0.7 + \frac{(4.2 + 47)\,28}{6K + 47}$$

$V_P =$

$$t_1 = R_1 C \log_e \frac{V - V_V}{V - V_P}$$

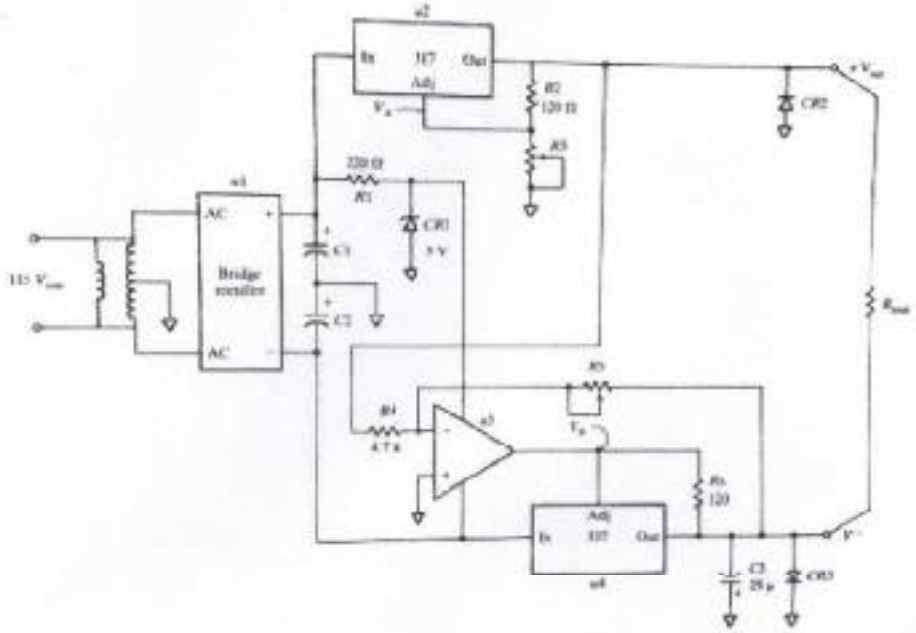


✓ 10P.

TERCER TEMA (32 PUNTOS)

Dado el circuito mostrado, calcular:

I_{R3}, V_{R3}, $+V_{out}$, V_{LM79XX}, I_{R4}, I_{R5}, V^-, V_R. (4 p cada item)



Datos: *R3=380 [Ω], R5=11.3 KΩ*

$R_3 = 380$ $V_{ref} = 1.25$ V $I_{adj} = 100$ uA

$V_{R_3} = (1.25)\left(1 + \frac{380}{380}\right) + (100\,uA)(380)$

$= 2.95$ V $+ 0.038$ V

$= 2.98$ V ✗

+ 2 P

Anthony Roger Chiquito Espinoza.

Paralelo: 2

67/100

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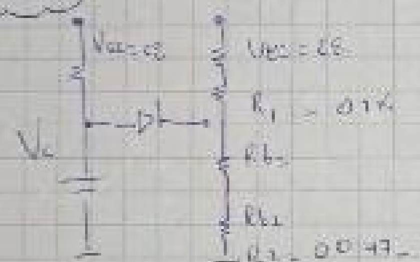
Anthony Chiquito

Firma de Compromiso del estudiante

Tema 2



$\eta = \frac{R_{b1}}{R_{bb}} \Rightarrow R_{b1} = 0.7\,(6K)$

$R_{b1} = 4.2K$

$R_{b2} = R_{bb} - R_{b1}$

$R_{b2} = 1.8K$

$$T_d = -R_C \ln\left(\frac{V_{cc} - V_{ep}}{V_{cc} - 0}\right)$$

$$V_{ep} = V_D + V_{cc}\,\frac{(R_{b1} + R_2)}{R_{bb} + R_1}$$

$$V_{ep} = 0.5 + 28\left(\frac{4.2K + 0.047K}{6K + 0.1K}\right)$$

$$V_{ep} = 0.5V + 19.49V$$

$$\boxed{V_{ep} = 19.99V}$$

$\frac{Vcc - V_{op}}{R} > I_p$

$\frac{28 - 19.99}{R} > I_p$

$R < \frac{28 - 19.99}{3\,mA}$

$R < 1\,K\Omega$

$\frac{Vcc - V_r}{R} < I_v$

$\frac{29 - 2}{R} < 1$

$R = \frac{26}{3\,mA}$

$R > 8.66K$

$8.66K < R < 1.6M$

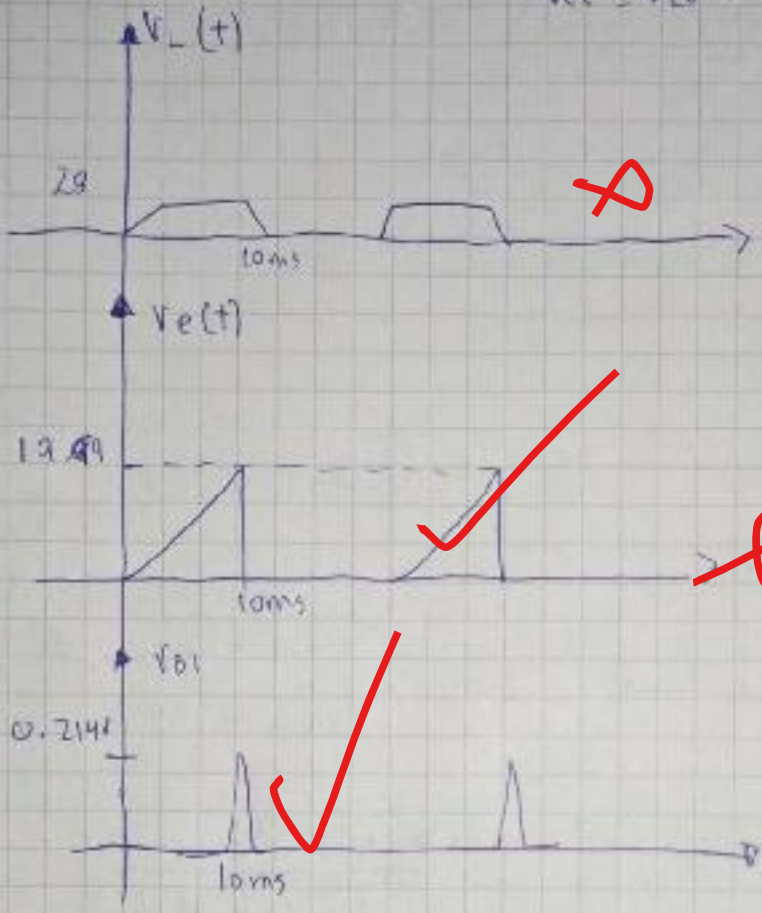
$R_f = 0.804M$

$C = \frac{td}{R \ln\left(\frac{Vcc - V_{op}}{Vcc - 0}\right)}$ + 2 op.

$C = \frac{10ms}{(0.804M)\ln\left(\frac{28 - 19.99}{28}\right)}$

$C = -\frac{10ms}{(0.804M)(-X)} = C = 9.45mf$

$V_{ec} = V_{LO} - V_{SCR}$



$$V_{B1} = \frac{28(0.047k)}{6k + 0.04 + k + 0.1k}$$

$V_{B1} = 0.214V$

Tema 3

A

$V_L = 1.25$ $V_{R3} = \frac{1.25\ (0.38k)}{1.20k} = 3.46\ V$ ✓ +3,5p

$I_{R3} = \frac{V_{R3} - 0}{0.38k} = \frac{3.96}{0.38k} = 10.4V$ ✓ voltios? +3p

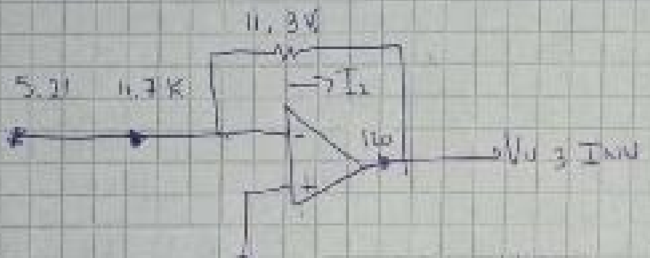
$V_{out} = V_{R3} + V_{R2}$

$V_{out} = 3.96V + 1.25V$

$V_{out} = 8.2V$ ✓ +4p

$V = 115 V_P \sqrt{2} \Rightarrow \frac{115\sqrt{2}}{2}$

$\frac{115\sqrt{2}}{2}$



$V_{AC} = \frac{115\sqrt{2}}{2}$

$V_{DC} = 81.3V$

$I_{DC} = +81.31V$ $V^+ = V_{DC} \Rightarrow V^- = V_{DC}$

$V^- = +81.31\ V$

$I_1 = I_2$

$\frac{5.21 - V^-}{4.7k} = \frac{V^- - V_{o3 IMN}}{11.3k}$

$V_{o3m} = \frac{-5.21\ (11.3k)}{4.7k} + \frac{11.3k}{4.7k} V^+ \quad V^+$

$V_{o3 ms} = 12.5V - 195.49 + 81.31$

~~$V_{o3m} = ...$~~

$V_{o3m} = 264.3\ V$ ✗

$I_{R4} = \frac{5.2 - 81.31}{4.7k} = 12.20\,mA$ ✗ +2p

$I_{R5} = \frac{81.31 - 264.3}{11.3k} = -16.20\,mA$ ✗ +2p

$V_B = 81.31 - 264.3 = -183V$ ✗

Tema1

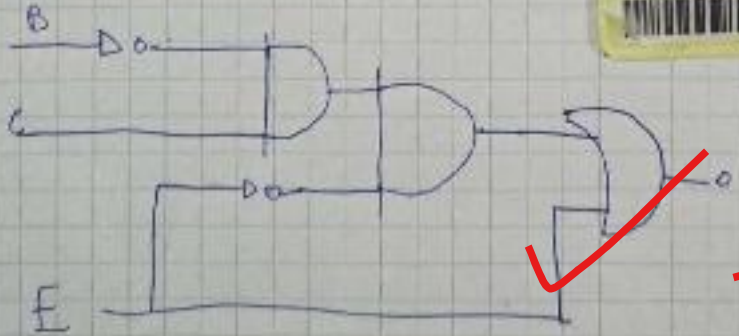
$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + ABC\bar{D}E + E$

$\bar{B}C\bar{E}(\underbrace{\bar{A}+A}_{1}) + BC\bar{D}E(\underbrace{\bar{A}+A}_{1}) + E$ ✓ +15p

$\bar{B}C\bar{E} + BC\bar{D}E + E$

$\bar{B}C\bar{E} + E(BC\bar{D}\underbrace{+1}_{1})$ ✓

$\bar{B}C\bar{E} + E = \bar{B}C + E$



✓ +7.5p

Tema 0

99/100

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Primer tema

$\bar{A}B\bar{C}\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$B\bar{C}\bar{E}(\bar{A}+A) + BC\bar{D}E(\bar{A}+A) + E$

a) La expresión booleana minimizada

$= \bar{A}B\bar{C}\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$= \bar{A}B\bar{C}\bar{E} + A\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + ABC\bar{D}E + E$

$B\bar{C}\bar{E}(A+\bar{A}) + BC\bar{D}E(\bar{A}+A) + E$

$A + \bar{A}B = A + B$

$A(B+\bar{B}) = B$

$A(1) = A$

$B\bar{C}\bar{E} + BC\bar{D}E + E$

$B\bar{C}\bar{E} + E(BC\bar{D}+1)$

$A + 1 = 1$

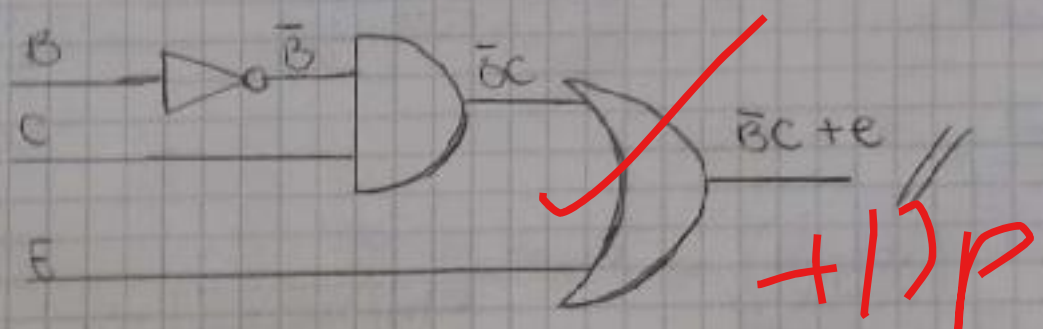
$B\bar{C}\bar{E} + E(1)$

$A + \bar{A}B\bar{E}$ $A+B$

$B\bar{C} + E$ //

+20p

b)



+10p

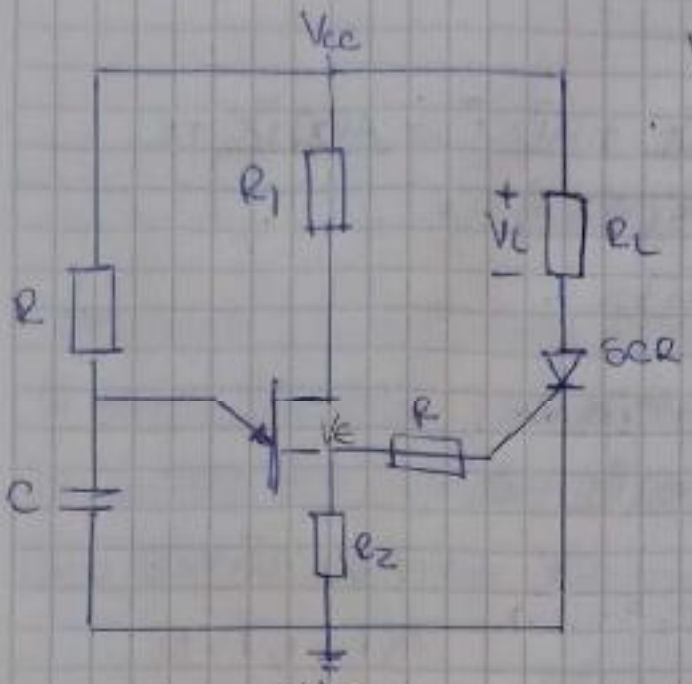
Tema 2

$\eta = 0.7$ $I_p = 5uA$ $R_{B1\,off}(100\Omega)$

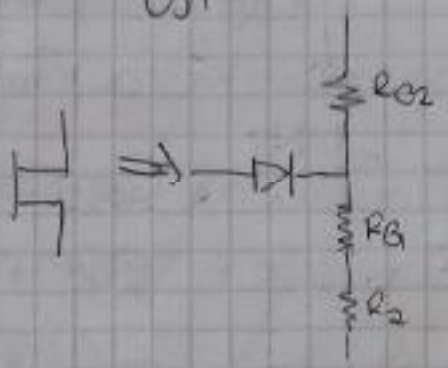
$R_{BB} = 6K\Omega$ $I_V = 3mA$ $R_L = 10\Omega$

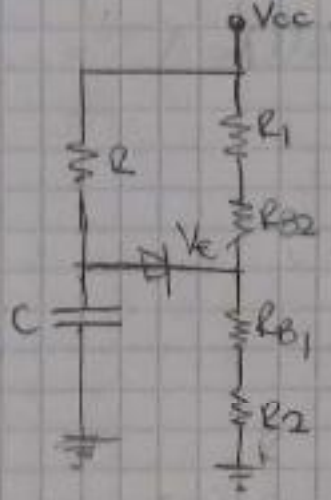
$V_{bb} = 0.5V$ $V_V = 2[V]$ $V_{cc} = 28V$

$R_2 = 47\Omega$



UJT





$R_{B1(dt)} = \eta R_{BB} = 0.7(6K\Omega) = 4.2K\Omega$

$R_{B2} = R_{BB} - R_{B1} =$

$V_e = V_{cc} \dfrac{R_2 + R_{B1dt}}{R_1 + R_{BB} + R_2} = 28\left(\dfrac{(47\Omega) + 4.2K\Omega}{100\Omega + 6K + 47}\right)$

$= 19.34V$ //

$V_p = V_D + V_e = 0.5 + 19.34$

$= 19.89\ V$ //

$T_c = 10ms$

$T_c = RC \ln\left(\dfrac{V_{cc} - V_{ic}}{V_{cc} - V_{ie}}\right) \Rightarrow C = \dfrac{T_c}{R \ln\left(\dfrac{V_{cc} - V_{ic}}{V_{cc} - V_p}\right)}$

$C = \dfrac{10ms}{R \ln\left(\dfrac{28}{28 - 19.34}\right)}$

$$\frac{V - V_v}{I_v} < R_1 < \frac{V - V_e}{I_p}$$

$$I_p < I_e < I_v \Rightarrow \quad < \frac{V_{cc} - V_r}{R} < 3mA$$

$$R > \frac{28 - V_v}{3mA} = \frac{28-2}{3mA} = 8.667\,k\Omega$$

$$R < \frac{28 - V_p}{5uA} = \frac{28 - 1.454}{5uA} = 1.63M\Omega$$

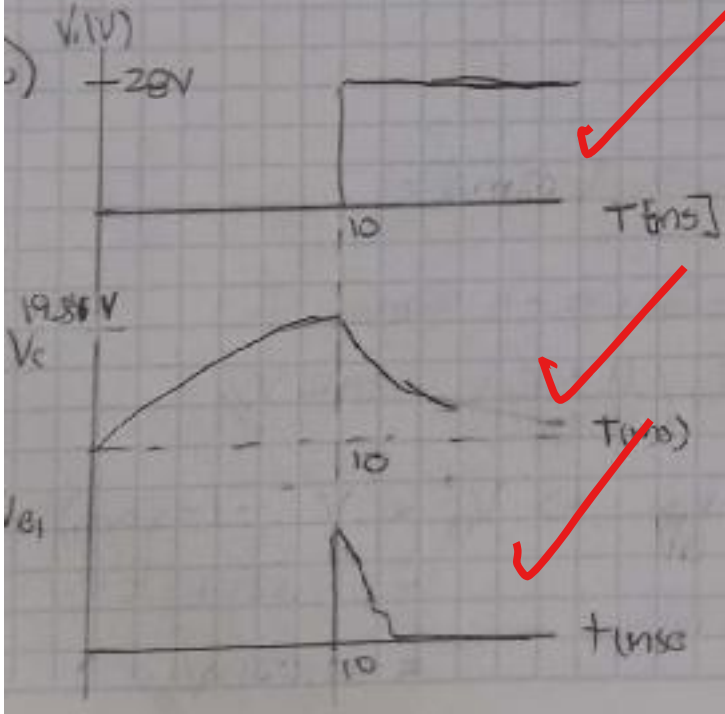
Si: $R = 50k\Omega$

$$C = \frac{10ms}{R\ln(3.5)}$$

$$C = 159{,}64 \times 10^{-9}\,F$$

Si: $R = 100k\Omega$

$$C = 79{,}83 \times 10^{-9}\,F$$



Se usará cuando pasen los dos diodos (el) colector

$$V_{B_1} = V_{cc} \cdot \frac{R_2}{R_1 + R_2 + R_{4k}} = 214{,}08 \times 10$$

$$28 \times \frac{47}{(100+47+6)k\Omega} = 219{,}08\,m$$

$$V_{B_1,on} = \frac{V_e\, R_2}{R_{Bon} + R_2} =$$

$$\frac{(19.34)(47)}{100+47} = 6.18\,V$$

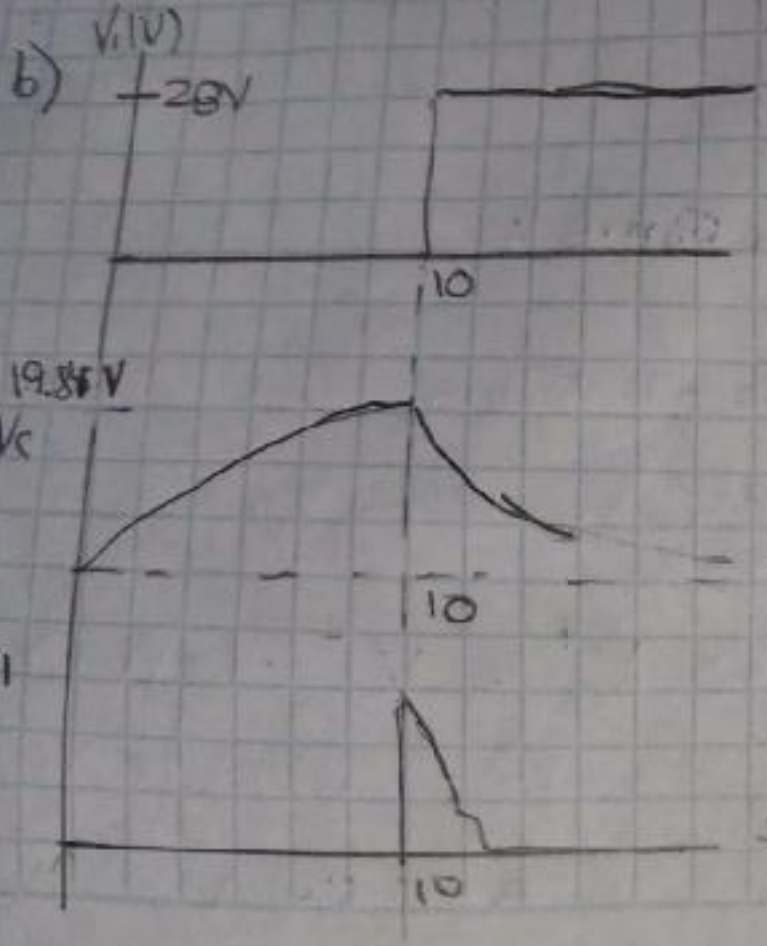
$C = \frac{}{R \ln(3.5)}$

$C = 159,64 \times 10^{-9}$ F //

S: $R = 100\,k\Omega$

$C = 79,83 \times 10^{-9}$ F //

b)



Se dispara cuando pasan los dos de carga del capacitor

$V_{B1} = V_{CC} \cdot \frac{R_2}{R_1 + R_2 + R_{bb}} = 214,08 \times 10^{-3}$ V

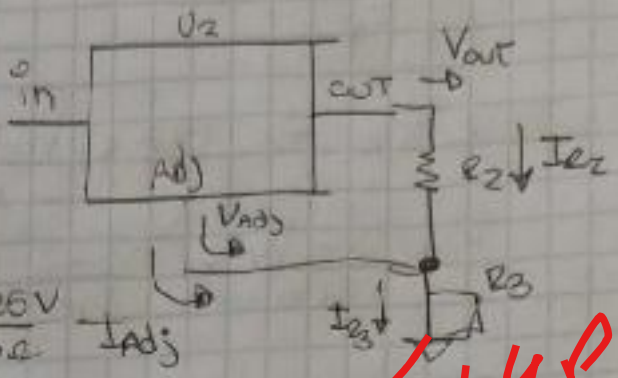
$28 \times \frac{47}{(100+47+6)k\Omega} = 219,08$ mV //

$V_{B1,on} = \frac{V_E \cdot R_2}{R_{on} + R_2} =$

$\frac{(19.34)(47)}{100+47} = 6.18$ V //

Tema 3

Análisis 3T //



despreciable

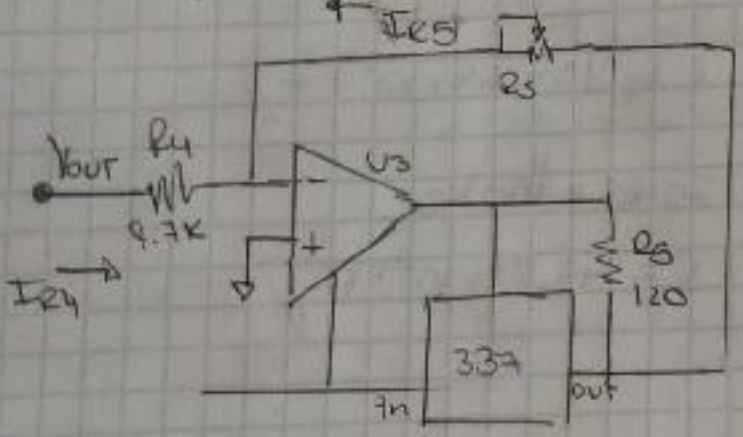
$I_{R3} = \cancel{I_{Adj}} + I_{R2}$

$I_{R3} = I_{R2} \Rightarrow \frac{V_{Adj}}{R_2} = \frac{1.25V}{120\Omega} - I_{Adj}$

$= 10.416 \times 10^{-3} \Rightarrow 10.416 mA$ +4P

$V_{R3} = I_{R3} R_3 = (10.416m)(380\Omega) = 3.958 V$ // +4P

$V_{OUT} = V_{Adj} + V_{R3} = 1.25 + 3.958 = 5.208 V$ // +4P



$I_{R4} = \frac{V_{OUT}}{R_4} = \frac{5.208}{4.7K\Omega} = 1.108 \times 10^{-3} = 1.108 mA$ +4P

$I_{R5} = -I_{R4} \Rightarrow +1.108 mA$ +3P

$V^- = -V_{OUT} \frac{R5}{R4} = -5.208 \times \left(\frac{11.3K\Omega}{4.7K\Omega}\right) = -12.521 V$ +4P

$V_{Adj} = -1.25V = V^- - V_B \Rightarrow V_B = V^- - (-V_{Adj})$

$= -12.521 + 1.25$

$= -11.821 V$ // 4P

José Carlos Del Pozo

Examen - 2P. Electrónica

45/100

Ejercicio 1

$\bar{A}B\bar{C}\bar{E} + \bar{A}BC\bar{D}\bar{E} + \bar{A}\bar{B}\bar{C}\bar{E} + AB\bar{C}DE + E$

a)

$= \bar{A}B\bar{C}\bar{E} + A\bar{B}\bar{C}\bar{E} + \bar{A}BC\bar{D}\bar{E} + AB\bar{C}DE + E$

$= C\bar{E}(\bar{A}\bar{B} + A\bar{B}) + \bar{D}E(\bar{A}BC + ABC) + E$

$= C\bar{E}[\bar{B}(\bar{A} + A)] + \bar{D}E[BC(A + \bar{A})] + E$

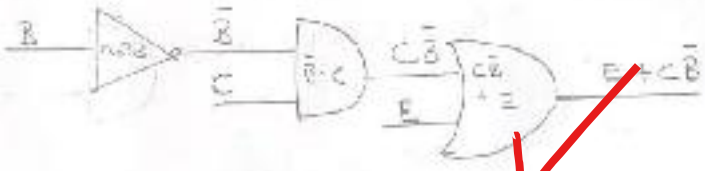
$= C\bar{E}\bar{B} + \bar{D}EBC + E$

$= C\bar{E}\bar{B} + E(\bar{A}BC + 1) = C\bar{E}\bar{B} + E = \bar{E}C\bar{B} + E$

Teorema $A + \bar{A}B = A + B$ ✓ +10p

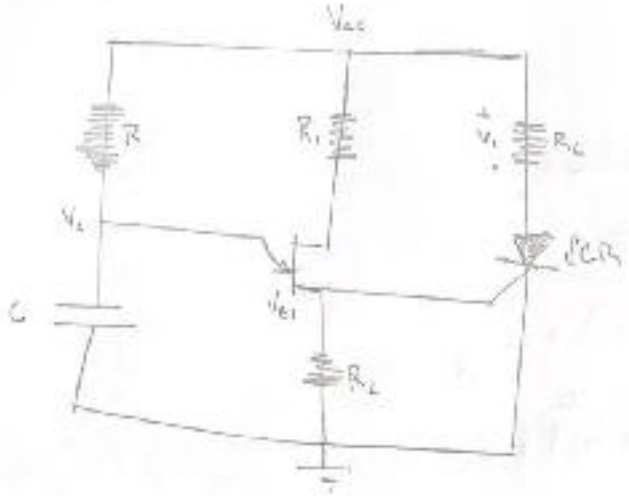
$= E + C\bar{B}$

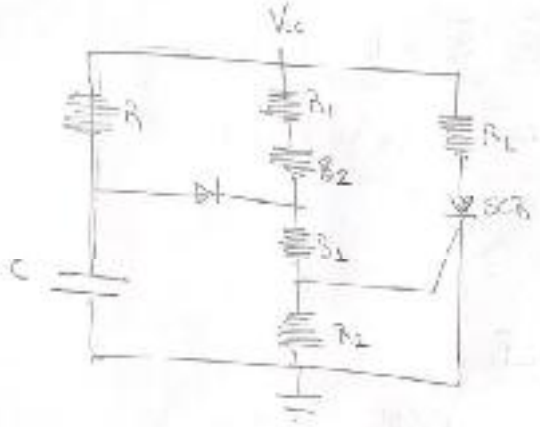
b)



+13p

Ejercicio N°2





$\eta = 0.7$

$R_{BB} = 4 [k\Omega]$

$V_D = 0.5 [V]$

$I_P = 5 [\mu A]$

$I_V = 3 [mA]$

$V_V = 2 [V]$

$R_{B1\,min} = 100 [\Omega]$

$V_{cc} = 28 [V]$

$R_1 = 100 [\Omega]$

$R_2 = 47 [\Omega]$

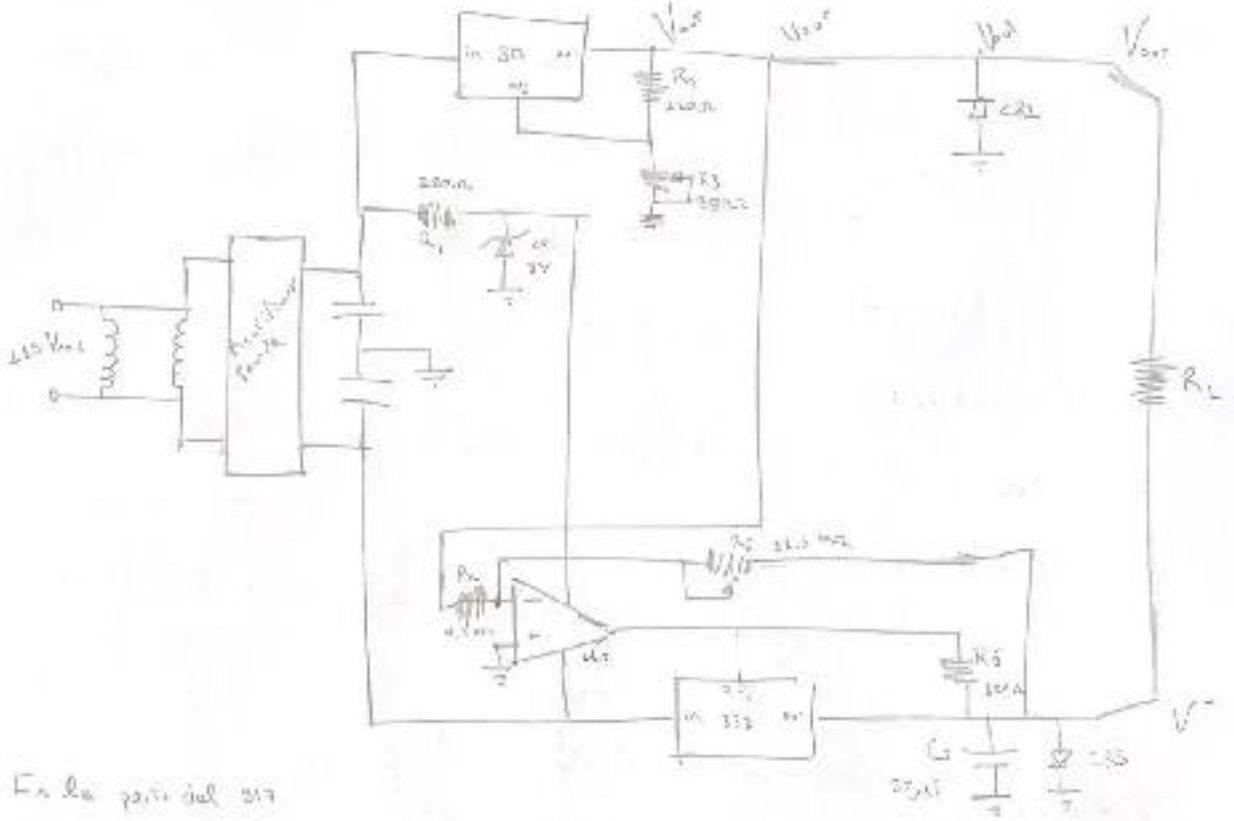
$R_L = 10 [\Omega]$

Sabemos, $R_{BB} = R_{B2} + R_{B1}$

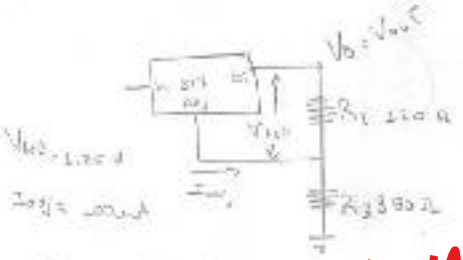
$\therefore R_{B2} = \eta \cdot R_{BB} = 0.2 [k\Omega]$

$\therefore V_{R1} = \dfrac{R_{B1}}{R_{B1} + R_{B2} + R_1} V_{BB} =$

Ejercicio N°3



En la parte del 317



Sabemos $V_o = V_{ref}(1 + \frac{R_2}{R_1}) + I_{adj} R_2$

$\Rightarrow$ [$V_o = 5.25$ [V]] $= V_{out}$ //

Sabemos $V_{R3} = V_o - V_{R2}$

$\Rightarrow V_{R3} = V_o - V_{ref}$

[$V_{R3} = 4$ [V]] //

Y como $V_{R3} = I_{R3} R_3$

$\Rightarrow I_{R3} = 0.010$ [A]

[$I_{R3} = 10.5$ [mA]] //

✓ + 4P

✓ + 4P

✓ + 4P

Examen de Electrónica

Enrique José Dávila Vidal Paralelo C

77/100

Reconozco que el presente dalen está diseñado para ser resuelto de manera individual, y no se permite el intercambio de información con otros estudiantes ni copias. Firmo, como constancia de lo anterior.

Tema 1

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

Utilizando Algebra de Boole:

Para la expresión minimizada se:

$X = \bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

Agrupando términos

$Y = E(\bar{A}BC\bar{D} + ABC\bar{D} + 1) + \bar{E}(\bar{A}\bar{B}C + A\bar{B}C)$

Por Algebra de Boole → $Y + 1 = 1$; $1 \cdot Y = Y$

$X = E + \bar{E}(\bar{A}\bar{B}C + A\bar{B}C)$

Por A. Boole $Y + \bar{Y}Z = X + Z$

$Y = E + \bar{A}BC + A\bar{B}C$ → Factorizando

$Y = E + \bar{B}C(\bar{A} + A)$

Algebra de Boole

$Y + \bar{Y} = 1$

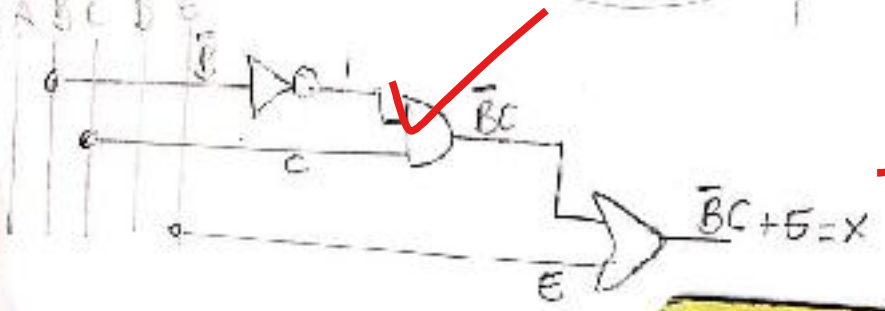
$Y = E + \bar{B}C(1)$

$X = \bar{B}C + E$

Finalmente se reduce a la mínima expresión booleana

+20p

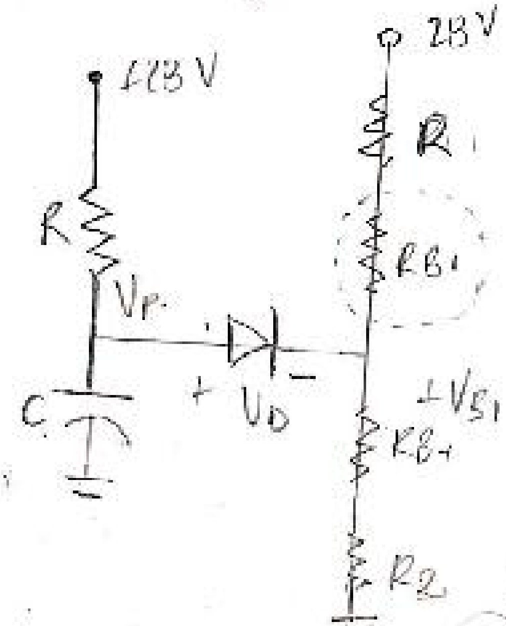
b)



+13p

Tema 2

Haciendo el esquemático de acuerdo a las resistencias y diodo



Dato R_{B1}

$R_{B1} = n R_{BB}$

$R_{B1} = 0.7(6 K\Omega)$

$R_{B1} = 4.2 K\Omega$ //

Para R_{B2}

$R_{B2} = R_{BB} - R_{B1}$

$= 6K\Omega - 4.2K\Omega$

$= 1.8 K\Omega$ //

→ Texto Guía

$$V_{B1} = \frac{V_{cc} + (R_{B1} + R_{B2})}{R_1 + R_{BB} + R_2} = \frac{28(420+47)}{100+6000+47} = 19.35V$$ //

→ Se asumen en ohms //

$V_p = V_{B1} + V_D = 19.35 + 0.5 = 19.85$ //

+8P

$V_c = V_{cc}(1 - e^{-t/\tau})$; Donde $t = 10\ ms$

$V_c = V_p = 19.85$

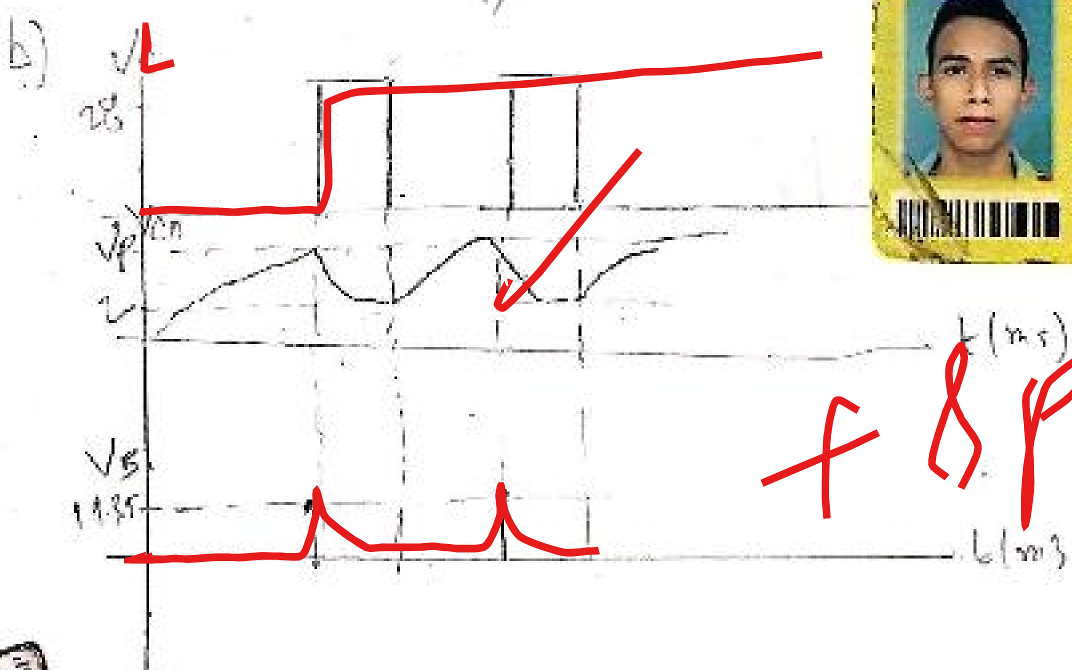
$V_{cc} = 28 V$

Datos Guía de Texto

$19.85 = 28(1 - e^{-10/\tau})$

$\tau = RC = 8.10 \times 10^{-3}$ //

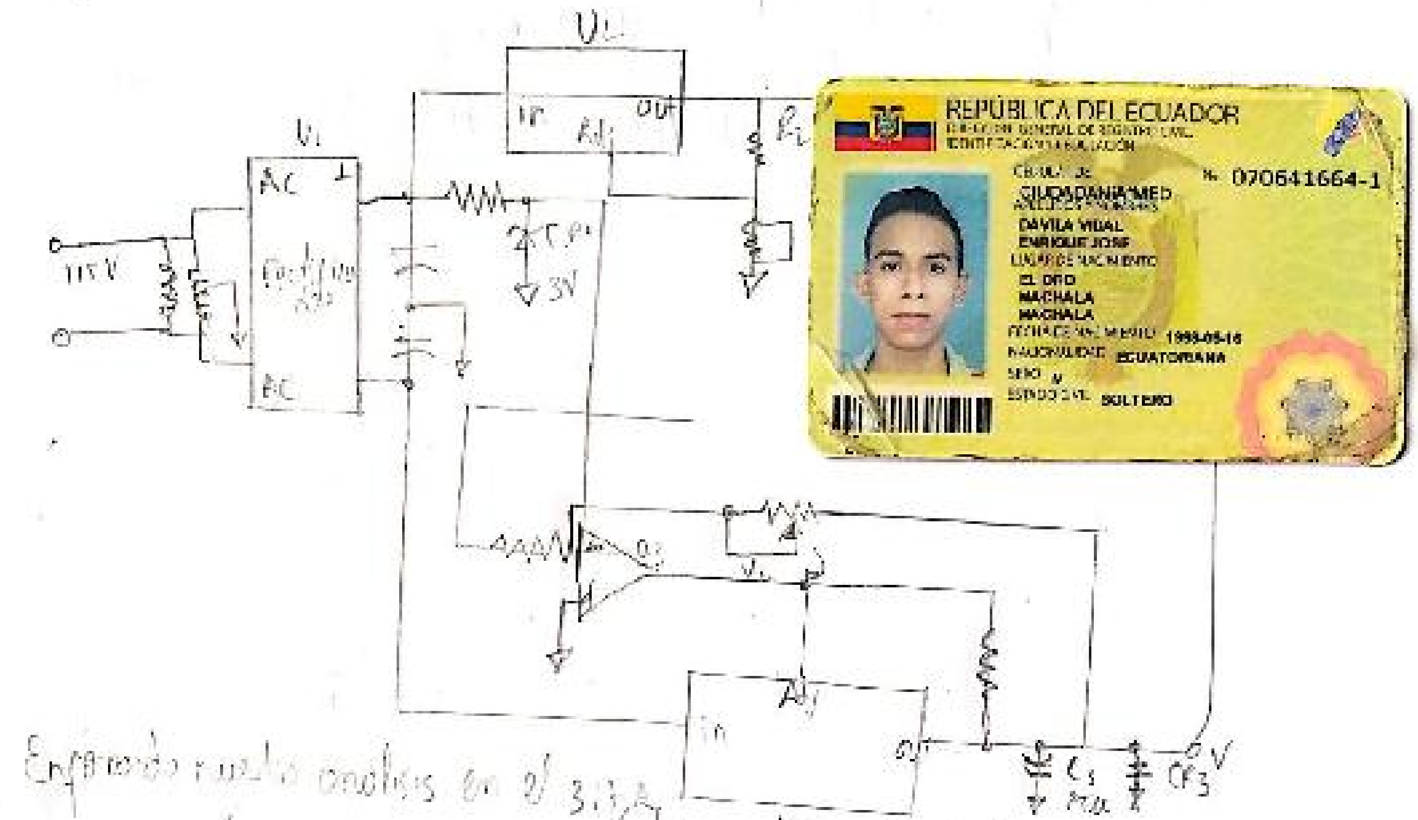
b)



+8P

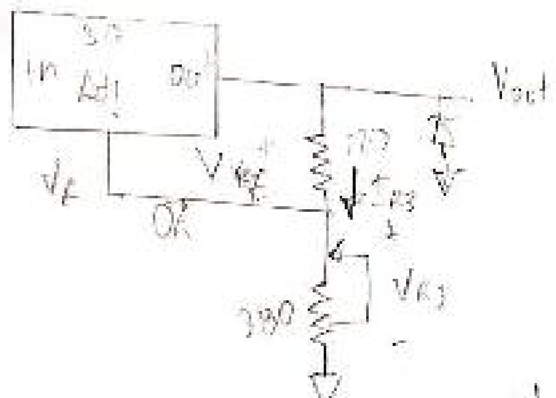
Escaneado con CamScanner

Tema 3 DÁVILA ENRIQUE



Empezando nuestro analisis en el 3.3 A

disponiendo Adj del mismo



$V_{ref} = 1.25V$

$I_{R3} = \frac{V_{ref}}{R_7} = \frac{1.25V}{120} = 0.0104166\ A$ ✓ +4p

$I_{R3} = 10.41666\ mA$

$V_{R3} = I_{R3}\ R_3 = \left(\frac{10.4166\ mA}{1000}\right)(383)$ ✓ +4p

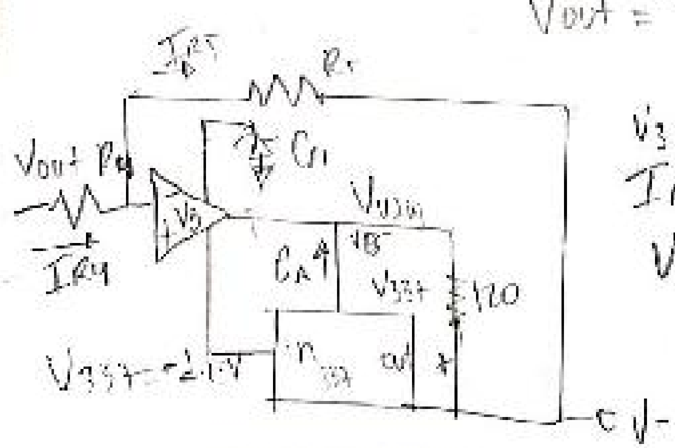
$V_{R3} = 3.989\ V$

$V_{out} = V_{REF} + V_{R3} = 1.25 + 3.989 = 5.22\ V$ ✓ +4p

V_3 en el nivel ✓ +4p

$I_{R4} = I_{R5}$

$V^- = -\frac{R_5}{R_4} V_{out}$; $V^- = \frac{1130}{4.7}(5.22) = 2.24V$ ✓ +4p



Escaneado con CamScanner

Para la corriente I_{R4}

$$I_{R4} = I_{R5} = -\frac{V^-}{R5} = -\frac{(-12.54)}{11.3} = 1.10 \text{ mA}_{//}$$ ✓ +4p

$$V_{V3\ INV} = -V_{33} + V^- = -(-1.25) - 12.54 = -11.29\ V_{//}$$ ✗

$$V_5 = V_{V3\ INV} = -11.29\ V_{//}$$ ✓ +4p

Tema 1

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$\bar{A}BC\bar{D}E + ABC\bar{D}E + E = \left(E + E\left(\bar{A}BC\bar{D} + ABC\bar{D}\right)\right)$

$= E\left(1 + \left(\bar{A}BC\bar{D} + ABC\bar{D}\right)\right)$

$= E(1) = E$

$\bar{A}+1=1$

$A+1=1$

60/100

$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + E$

$E\left(\bar{A}\bar{B}C + A\bar{B}C\right) + E$

$A + \bar{A}B = A + B$

$E + \left(\bar{A}\bar{B}C + A\bar{B}C\right)$

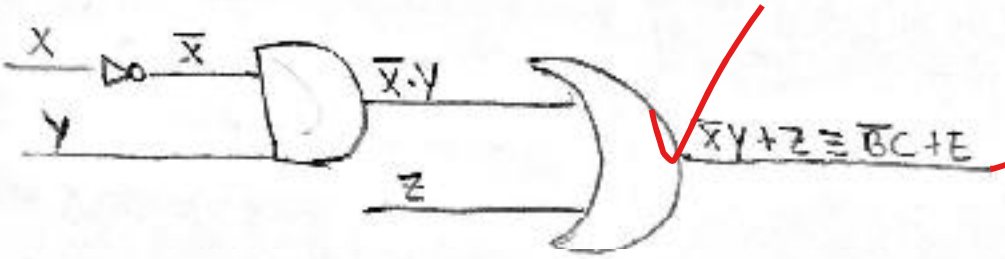
$E + \bar{B}C$

$\bar{B}C + E$ Resultado +20p

$\bar{A}\bar{B}C + A\bar{B}C$

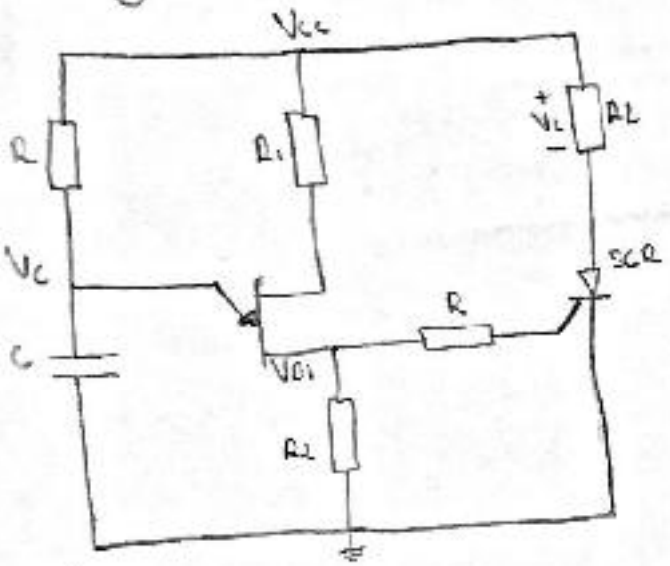
$\bar{B}\left(\bar{A}C + AC\right)$ → $AB + \bar{A}B = B$

$\bar{B}(C) = \bar{B}C$



$\bar{X}Y + Z = \bar{B}C + E$ +13p

Tema (2)



$\eta = 0.7$, $R_{BB} = 6[k\Omega]$, $V_D = 0.5[V]$, $I_P = 5[\mu A]$
$I_V = 3[mA]$, $V_V = 2[V]$, $R_{G(on)} = 100[\Omega]$
$V_{cc} = 28V$, $R_1 = 100[\Omega]$, $R_2 = 47[\Omega]$, $R_{con}[\Omega]$

a)

$V_p = V_D + \eta V_{cc}$

$V_p = 0.5V + 0.7(28V)$

$V_p = 20.1[V]$

$$\frac{V_{cc} - V_V}{I_V} < R < \frac{V_{cc} - V_P}{I_P}$$

$$\frac{28V - 2V}{3mA} < R < \frac{28V - 20.1V}{5\mu A}$$

$8.666k\Omega < R < 1.58M\Omega$

$t_{OFF} < t_{ON}$

$T = t_{OFF}$

$R = 100k\Omega$ → Porque?

$$t_{ON} = R \times C \times \ln\left(\frac{V - V_V}{V - V_P}\right)$$

$$19ms = 100k\Omega \times C \times \ln\left(\frac{28 - 2}{28 - 20.1}\right)$$

$C = 0.08\mu F$

+15p

Tema 3

Datos = $R_3 = 380[\Omega]$, $R_5 = 11.3k\Omega$

Calcular:

$I_{R_3}, V_{R_3}, V_{out}, V_{U3:IN}, I_{R_1}, I_{R_2}, V, V_D$

$I_{R_3} = I_{R_2} + I_{Adj}$

$I_{R_3} = \frac{V_{Adj}}{R} + 0$

$I_{R_3} = \frac{1.25V}{120\Omega}$

$I_{R_3} = 0.01042A = 10.42mA$ ✓ +4p

$V_{R_3} = I_{R_3} R_3$

$V_{R_3} = (10.42mA)(380\Omega)$

$V_{R_3} = 3.96V$ ✓ +4p

$V_{out} = V_{Adj} + V_{R_3}$

$V_{out} = 1.25 + 3.96V$

$V_{out} = 5.21V$ ✓ +4p

NOMBRE: FREIRE SÁNCHEZ CARLOS AARÓN PARALELO: 2

EXAMEN ELECTRÓNICA II PARCIAL, 25-2021

COMPROMISO DE HONOR: RECONOZCO QUE EL PRESENTE EXAMEN ESTÁ DISEÑADO PARA SER RESUELTO DE MANERA INDIVIDUAL, Y NO SE PERMITE LA AYUDA DE FUENTES NO AUTORIZADAS. MI COPIA. FIRMO AL PIE DE PRESENTE COMPROMISO, COMO CONSTANCIA DE HABER LEÍDO Y ACEPTADO LA DECLARACIÓN ANTERIOR.

Aarón

FIRMA COMPROMISO

44/100

1.-

$\bar{A}\bar{B}C\bar{E} + \bar{A}B\bar{C}\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}\bar{E} + E$

$C(\bar{A}\bar{B}\bar{E} + \bar{A}B\bar{D}E + A\bar{B}\bar{E} + AB\bar{D}\bar{E}) + E$

$C[\bar{B}\bar{E}(\bar{A}+A) + B\bar{D}E(\bar{A}+A)] + E$

$\bar{B}\bar{E}$ (1) $B\bar{D}E$ (1)

$C[\bar{B}\bar{E} + B\bar{E}\bar{D}] + E \Rightarrow C[\bar{B}\bar{E}(1+\bar{D}) + B\bar{E}\bar{D}] + E$

$\bar{B}\bar{E} \neq \bar{B}\bar{E}$

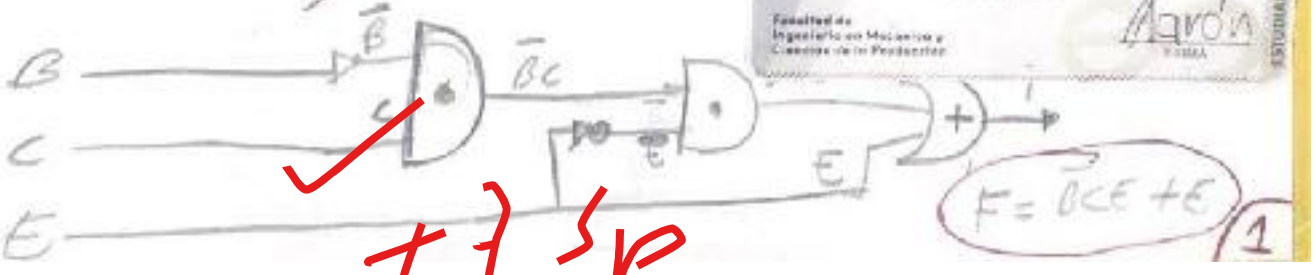
$= C\bar{B}\bar{E} + C\bar{B}\bar{E}\bar{D} + E \rightarrow C\bar{B}\bar{E} + E(C\bar{D}+1)$

$C\bar{B}\bar{E} + E$

$\therefore \bar{B}C\bar{E} + E \neq \bar{B}C + E$

+1 Sp

Sin



+1.5p

1

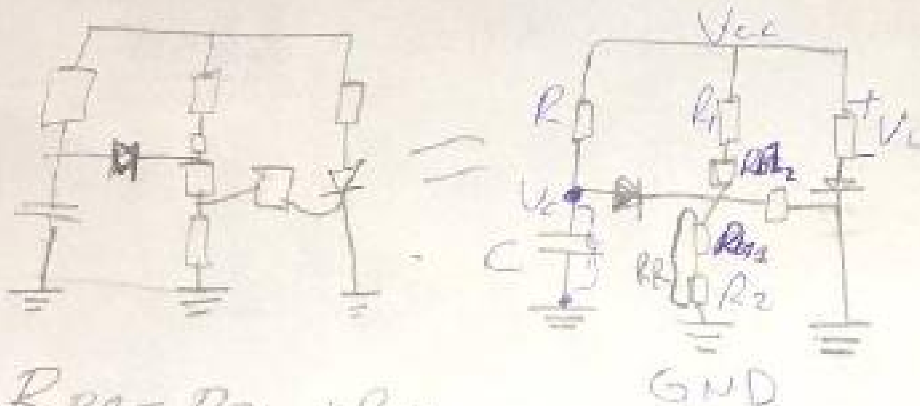
2.-

DATOS:

$\eta = 0.7$; $R_{BB} = 6[k\Omega]$; $V_D = 0.5[V]$; $I_P = 5[\mu A]$

$I_V = 3[mA]$; $V_V = 2[V]$; $R_{B1}(0\mu) = 100\,\Omega$; $V_{cc} = 28V$

$R_1 = 100[\Omega]$; $R_E\ 47[\Omega]$; $R_L = 10[\Omega]$



$R_{BB} = R_{B1_1} + R_{B1_2}$

$(R_{BB})(\eta) \rightarrow R_{B1_1} = (6k\Omega)(0.7) = 4200\Omega$

$(6k\Omega) = [4200\Omega] + R_{B1_2} \rightarrow R_{B1_2} = 1800\Omega$

DEL DIVISOR DE VOLTAJE SE TIENE:

$$R_i = \frac{R_R}{R_R + R_1 + R_{B12}} = \frac{R_{B1_1} + R_2}{R_{B1_1} + R_2 + R_1 + R_{B1_2}} = \frac{4200 + 47}{1800 + 47 + 100 + 4200}$$

$R_i = 0.690906\,\Omega$

$V_C = V_D + V_{cc} R_i = 0.5 + 28(0.690906) = 19.845$

✓ XSP

3.- DATOS:

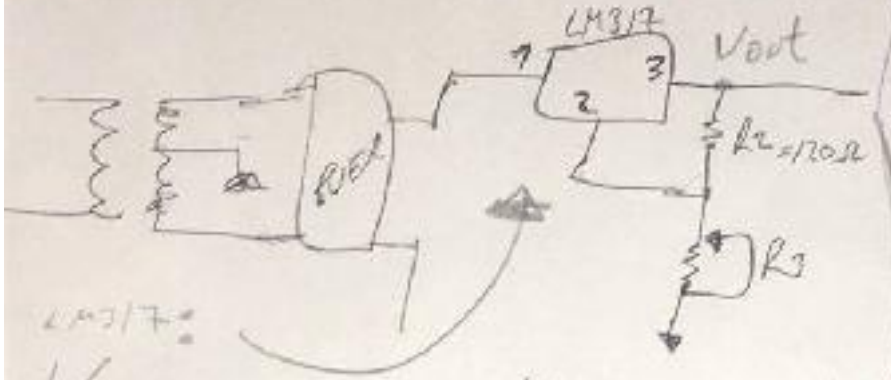
$R_3 = 360\Omega$; $R_5 = 11.3K\Omega$;

$I_{R3} = ?$ / $V_{out} = ?$

$V_{R3} = ?$ / $V_{OFFSET} = ?$

$V^- = ?$ / $V_0 = ?$

$I_{R4} = ?$ / $I_{R5} = ?$



LM317:

$V_{ADJ} = 1.25V \rightarrow V_{R2} = 1.25V$

$V_{R3} = V_{ADJ}\left(\frac{R_3}{R_2}\right) = 1.25\left(\frac{360}{120}\right) = 3.96V$

$V_{out} = V_{R2} + V_{R3}$

$= 1.25 + 3.96 = 5.20$

$V_{out} = 5.20V$ ✓ +4P

✓ +4P

$V_{R3} = I_{R3} R_3 \Rightarrow I_{R3} = V_{R3}/R_3 = \left(3.96/360\times10^{-3}\right) = 10.99$

$I_{R3} = 10.42\ mA$ ✓ +4P

$V_{RMS} = 115 \rightarrow V_{PICO} = 115\sqrt{2} \rightarrow$

$V_p = 2V_5$

$V_5 = \frac{115\sqrt{2}}{2} = 81.31$

$V_5 = \frac{115\sqrt{2}}{2} = 81.31$

RELACIÓN 1:1

SECCIÓN DE LA TIERRA SE DIVIDE PARA 2

$V_5 = 81.31$; $V^+ = V_5 = 81.31$

$I_1 = \frac{V_{out} - V^+}{R4}$; $I_2 = \frac{V^+ - V_{OFFSET}}{R5}$

$I_1 = I_2 = \frac{5.20 - V^+}{9.7K} = \frac{V^+ - V_{OFFSET}}{11.3K}$

$$V_{3in} = -\frac{11.3k}{9.74}(5.20 - V^+) + V^+$$

$$V_{out} = -\frac{(5.20)(11.3k)}{9.74} + \underbrace{V^+}_{81.71}\left(1 + \frac{11.3k}{9.74}\right)$$

$$V_{out} = 289.3021\,V$$

$$I_{R4} = \frac{V_{out} - V^+}{R4} \checkmark \quad ; \quad I_{R5} = \frac{V^+ - V_{out}}{R5} \checkmark$$

+2p

+1p

$$I_{R4} = -16.19mA$$

$$I_{R5} = -18.91mA$$

$$V_0 = 81.71 - 289.30 \times (207.992)$$

Segundo Examen

Nombre: Victor Gonzalez Quinto

Compromiso de honor

Reconozco que el presente dibex está diseñado para ser resuelto de manera individual y no se permite la ayuda de fuente no autorizada ni copiar. Firmo al pie del presente compromiso, como constancia de haber leído y aceptar la declaración anterior.

Firma de compromiso del estudiante

50/100

#1

$\bar{A}\bar{B}C\bar{E} + \bar{A}B\bar{C}\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

a) La expresión lógica minimizada

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + ABC\bar{D}E + E$

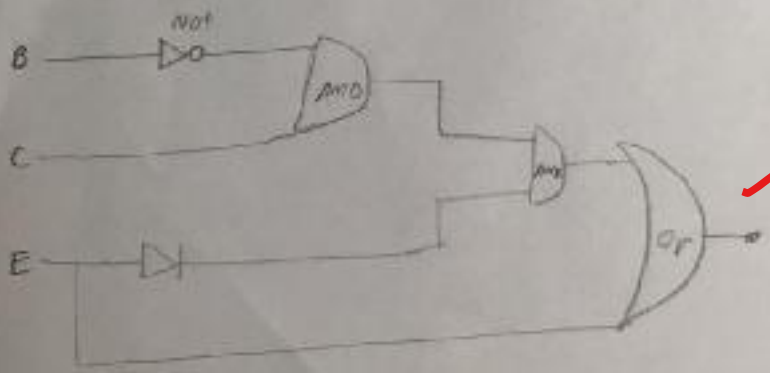
$\bar{B}C\bar{E}(\bar{A} + A) + BC\bar{D}E(\bar{A} + A) + E$

$\bar{B}C\bar{E} + BC\bar{D}E + E$

$\bar{B}C\bar{E} + E(BC\bar{D} + 1)$

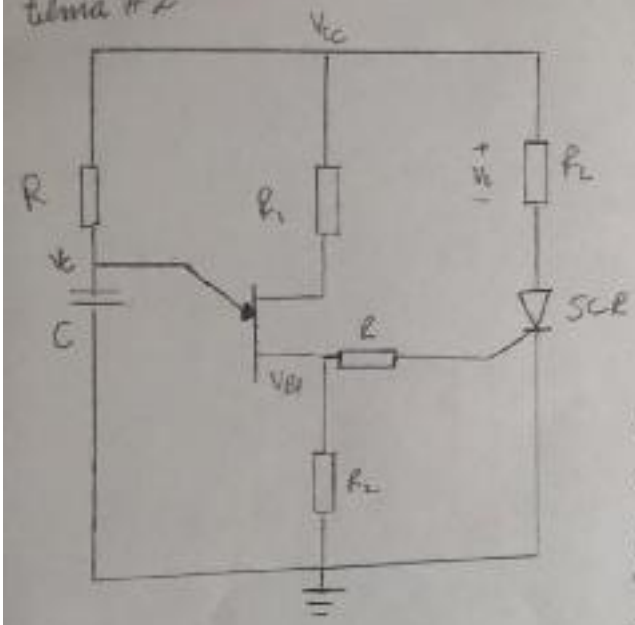
$F + \bar{B}C\bar{E} = E + \bar{B}C$

+1.5p



+1.5p

Tema #2



$\eta = 0.7$ $\quad R = ?$

$R_{BB} = 6\,[k\Omega]$ $\quad C = ?$

$V_D = 0.5[V]$

$I_P = 5\,[\mu A]$

$I_V = 3\,[mA]$

$V_V = 2[V]$

$P_{R1(om)} = 100\,\Omega$

$V_{cc} = 28V$

$R_1 = 100[\Omega]$

$R_2 = 47[\Omega]$

$R_L = 10[\Omega]$

$\eta = \frac{R_{b1}}{R_{BB}} \rightarrow R_{b1} = \eta R_{BB}$

$R_{b1} = 0.7(6) = \underline{4.2\,[k\Omega]}$

$R_{BB} = R_{b1} + R_{b2}$

$R_{b2} = R_{BB} - R_{b1} = 6k - 4.2k = \underline{1.8\,k\Omega}$

$V_C = V_D + \frac{V_{cc}(R_{b1} + R_2)}{R_{BB} + R_1 + R_2}$

$V_C = 0.5 + \frac{28(4.2k + 0.047k)}{6k(0.1 + 100 + 47)}$

$V_C = 19.78 > 20$ ✗

$\frac{V_{cc} - V_{CP}}{R} > I_P$

$R < \frac{V_{cc} - V_P}{I_P}$

$R = \frac{28 - 20}{5 \times 10^{-6}} = 1.6\,M\Omega$

$\boxed{R_1 = 1.6\,M\Omega}$ ✓

$\frac{V_{cc} - V_V}{R} > I_V$

$R > \frac{V_{cc} - V_V}{I_V}$

$R = \frac{28 - 2}{3 \times 10^{-3}} = 8.66\,k\Omega$

$R_2 = 8.66\,k\Omega$ ✓

$R = \frac{R_1 + R_2}{2}$

$R = 8.04 \times 10^{5}\,\Omega$

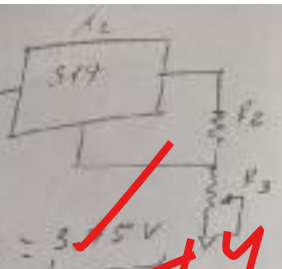
$R = 0.8\,M\Omega$ ✓

$t_1 = RC \ln\left(\frac{V_{cc} - V_C}{V_{cc} - 0}\right)$

$C = \frac{t_1}{R \ln\left(\frac{V_{cc} - V_C}{V_{cc}}\right)} = \frac{10\,ms}{(0.8M)\ln\left(\frac{28-20}{28}\right)} = 10\,mf$

+1 SP

Tema #3



$V_{ADJ} = 1.25$ X --> $V_{R_2} = 1.25$ V ✓

$V_{R_3} = 1.25\left(\frac{R_3}{R_2}\right) = 1.25\left(\frac{380}{120}\right) = 3.95$ V ✓ +1p

$V_{out} = V_{R_2} + V_{R_3} = 3.95 + 1.25 = 5.21$ V ✓ +1p

$V_{R_3} = I_{R_3} R_3$

$I_{R_3} = \frac{V_{R_3}}{R_3} = \frac{3.95}{380} = 0.010$ A ✓ +1p

$R_3 = 380\,\Omega$

$R_5 = 113\,\Omega$

$I_{R_2} = ?$ ✓

$V_{R_3} = ?$ ✓

$+V_{out} = ?$ ✓

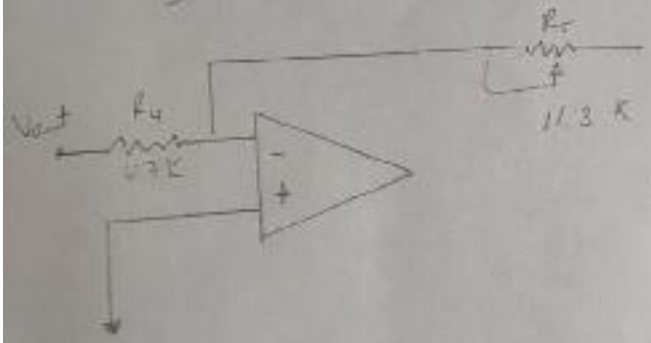
$V_{out\,INV} = ?$

$I_{R_4} = ?$

$I_{R_5} = ?$

$V^- = ?$

$V_P = ?$



$V^+ = V_P$ ✓ $V^- = V^+$ $V_P = \frac{11.5\sqrt{2}}{2}$

$V_P = 11.3$ V

$V^+ = 11.3$ V

$J_1 = J_2$

$\frac{5.20 - V^-}{0.7\,\Omega} = \frac{V^- - V_{MSINV}}{113\,k}$

$V_{MSINV} = -5.20\frac{(113)}{(0.7)} + V^+\left(1 + \frac{113}{0.7\,k}\right)$

$V_{MSINV} = 26.3$ V

Nombre: Madeleine Guale Mora

Paralelo:

Fecha: 25 de Enero 2022

Compromiso de Honor

Recuerda q' el presente debe ser resuelto de forma individual, no se permite la copia de fuentes no autorizadas ni copiar. Firma al pie del compromiso como constancia de haber leído y aceptar la declaración

Nota: La copia anulará tu nota a cero.

8 1/100

1er Tema.

En el siguiente problema, reducir la siguiente expresión lógica usando Algebra de Boole: (3p)

$$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}\bar{E} + E$$

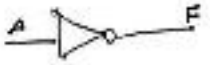
a) Expresión lógica minimizada :D

b) Implemente la expresión mínima encontrada en el literal (a) usando una única compuerta de, AND y NOT

HINT:

F = A and B
= A . B

F = A or B
F = A + B



F = not (A)
F = $\bar{A}$

a) $(\bar{A}\bar{B}C\bar{E}) + E + (E\bar{A}BC\bar{D}) + (A\bar{B}C\bar{E}) + ABC\bar{D}\bar{E}$

$A\bar{B}C\bar{E} + (E + (E\bar{A}BC\bar{D})) + (A\bar{B}C\bar{E}) + E\bar{A}BC\bar{D}$

$\bar{A}\bar{B}C\bar{D} + E + A\bar{B}C\bar{E} + E\bar{A}BC\bar{D}$

$A\bar{B}C\bar{E} + (E + (E\bar{A}BC\bar{D})) + ABC\bar{E}$

$\bar{A}\bar{B}C\bar{E} + E + A\bar{B}C\bar{E}$

$E + (\bar{E}\bar{A}\bar{B}\cdot C) + A\bar{B}C\bar{E}$

$E + \bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E}$?

$E + A\bar{B}C\bar{E} + A\bar{B}C\bar{E}$?

$\bar{B}C(A + \bar{A})^{-1} + E$

$\bar{B}C + E$ ✓

+1sp

(+1)

2do tema

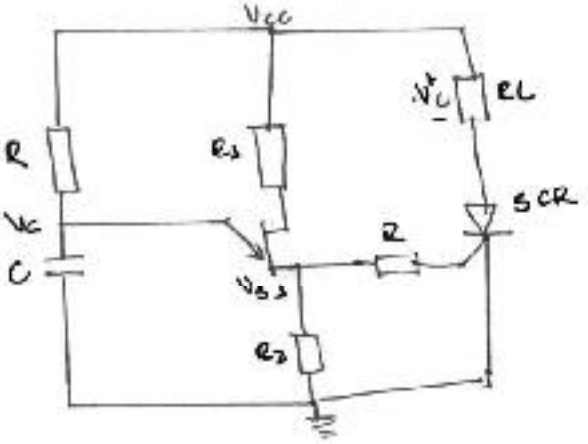
Considerando que el circuito debe escilar:

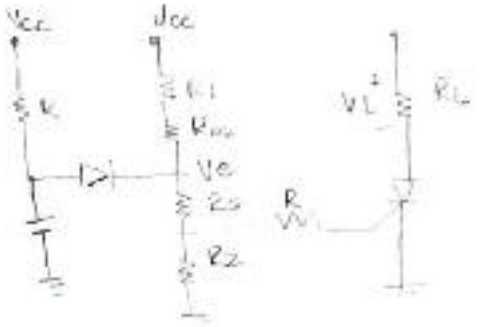
a) Determinar los valores de R, C para que exista un retardo de 10ms. (20)

b) Graficar las señales de $V_L(t)$, $V_C(t)$, $V_{B1}(t)$. (15)

$\eta = 0.7$, $R_{BB} = 6[K\Omega]$, $V_D = 0.7[V]$ $I_P = 5[\mu A]$, $I_V = 3[mA]$, $V_V = 2[V]$, $R_{SCR\,ON} = 100\,\Omega$

$V_{CC} = 28V$, $R_1 = 100\,\Omega$, $R_2 = 42[\Omega]$ $R_L = 10[\Omega]$





$V_{CC} = 28V$

$R_{b1(off)} = \eta R_{BB} = 4.2\ K\Omega$

$R_{b2} = R_{BB} - R_{b1(off)} = 1.8\ K\Omega$

$V_e = V_{CC}\dfrac{R_2 + R_{b1(off)}}{R_1 + R_{BB} + R_2} = 19.35V$

$V_P = V_D + V_e = 19.85[V]$

$I_P < I_e < I_V$

$5\mu A < \dfrac{V_{CC} - V_e}{R} < 3mA$

$R > \dfrac{28 - V_P}{3mA} \rightarrow R > 2.66\ K\Omega$

Incorrecto Resistencia

$R < \dfrac{28 - V_P}{5\mu A} \rightarrow R < 1.63\ M\Omega$

$t_c = 10ms$ para la carga

$t_c = RC\ln\left(\dfrac{V_{CC} - V_{IC}}{V_{CC} - V_{FC}}\right)$

$t_c = RC\ln\left(\dfrac{28}{28 - V_P}\right)$

$C = \dfrac{t_c}{R\ln\left(\dfrac{28}{28 - 19.85}\right)}$

Si $R = 25K$ (dentro del intervalo)

$C = \dfrac{10}{25\ln\left(\dfrac{28}{28 - 19.85}\right)}$

$C = 0.3241\ \mu F$ //

+20p

2do Tema

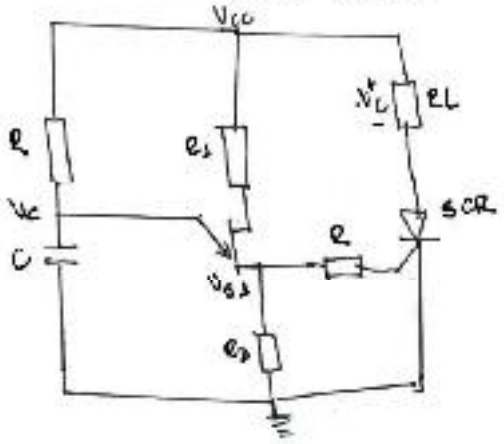
Considerando que el circuito debe oscilar:

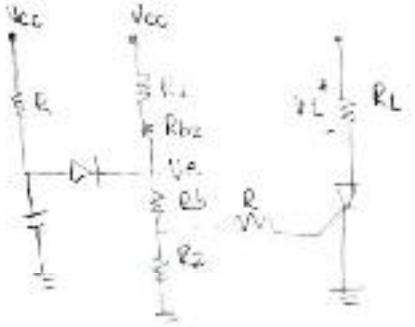
a) Determinar los valores de R, C para que exista un retardo de 10 ms. 20

b) Graficar las señales de $V_L(t)$, $V_c(t)$, $V_{B1}(t)$. (c/c)

$\eta = 0.7$, $R_{BB} = 6[k\Omega]$, $V_\gamma = 0.7[V]$ $I_P = 5[\mu A]$, $I_V = 3[mA]$, $V_V = 2[V]$, $R_{1\,min} = 100\,\Omega$

$V_{CC} = 28V$, $R_1 = 100\,\Omega$, $R_2 = 4.2[k\Omega]$ $R_L = 10[\Omega]$





$V_{CC} = 28V$

$R_{b1(off)} = \eta R_{BB} = 4.2\,k\Omega$

$R_{b2} = R_{BB} - R_{b1(off)} = 1.8\,k\Omega$

$V_e = V_{CC}\,\dfrac{R_2 + R_{b1(off)}}{R_1 + R_{BB} + R_2} = 19.35V$

$V_P = V_{D1} + V_E = 19.85[V]$

$I_P < I_R < I_V$

$5\mu A < \dfrac{V_{CC} - V_e}{R} < 3mA$

$R > \dfrac{28 - V_P}{3mA} \rightarrow R > 8.66\,k\Omega$

Intervalo Resistencia

$R < \dfrac{28 - V_P}{5\mu A} \rightarrow R < 1.63\,M\Omega$

t_c = tiempo para la descarga

$t_c = RC\ln\left(\dfrac{V_{cc} - V_{ic}}{V_{CC} - V_{fc}}\right)$

$t_c = RC\ln\left(\dfrac{28}{28 - V_P}\right)$

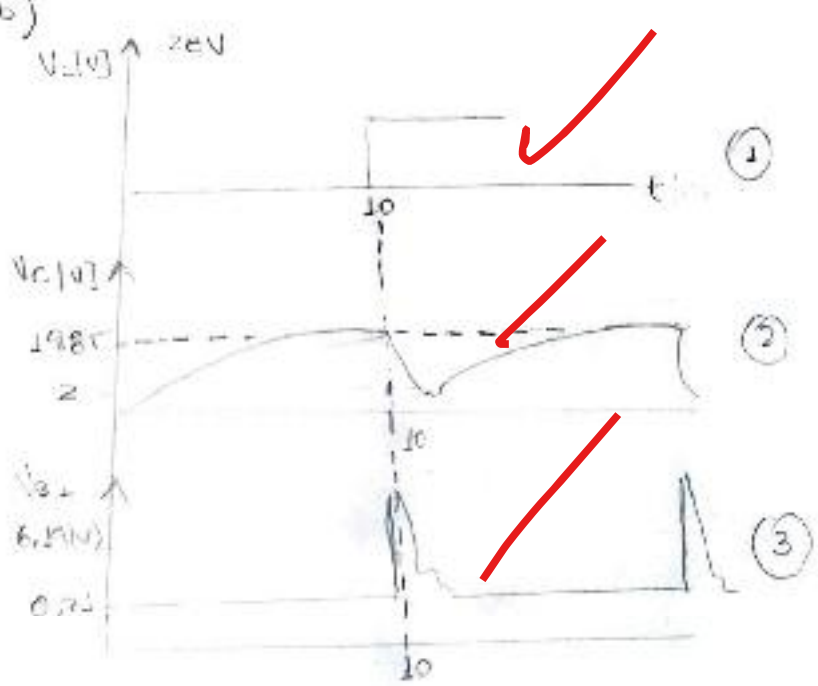
$C = \dfrac{t_c}{R\ln\left(\dfrac{28}{28 - 19.85}\right)}$

Si $R = 25k$ (valor de diseño)

$C = \dfrac{10}{25\ln\left(\dfrac{28}{28 - 19.85}\right)}$

$C = 0.3241\,\mu F$ //

b)

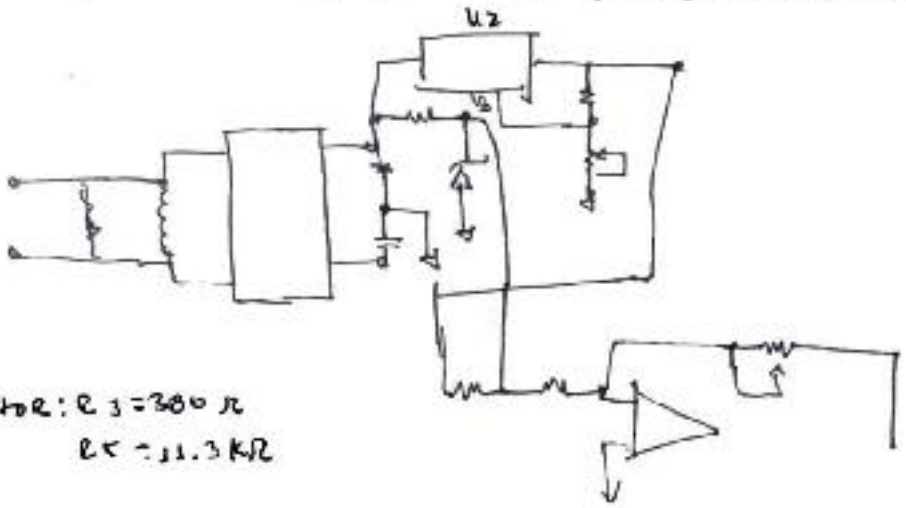


$$V_{B1(OFF)} = \frac{20 \cdot R_2}{R_1 + R_2 + R_3} = 0,7 \text{ V}$$

$$V_{B1(ON)} = \frac{V_{CK} \cdot R_3'}{R_3(ON) + R_2} = 6,5 \text{ V}$$

+15p.

3er tema) Calcular I_{R2}, V_{R3} + V_{out}, $V_{U3\,ENV}$, I_{R4}, I_{RF}, V^-, V_B (LTC/LM...)



Datos: $R_3 = 380\,\Omega$

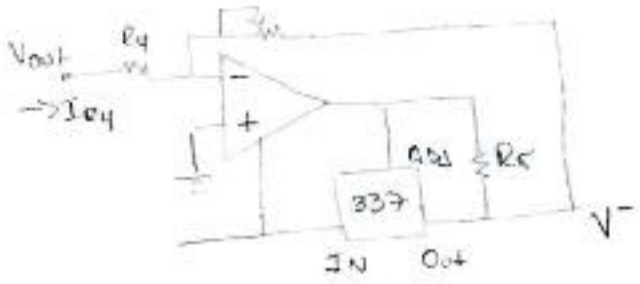
$R_F = 11.3\,K\Omega$

$I_{R3} = I_{R2} + I_{ADJ}$

$I_{R3} = I_{R2} = \frac{V_{ADJ}}{R_2} = \frac{2.25\,V}{120\,\Omega} = 10.42\,mA$ //

$V_{R3} = I_{R3} R_3 = (10.42)(0.38) = 3.96\,V$ //

$V_{out} = V_{ADJ} + V_{R3} = 6.21\,V$ //



$V_{U3\,ENV} = 0\,V$ //

$I_{R4} = \frac{V_{out} - V_{U3\,ENV}}{R_4} = \frac{6.21\,V}{0.3\,K\Omega}$

$I_{RF} = -I_{R4} = -$

$V^- = -V_{out} \times \frac{R_F}{R_4} = -6.21\left(\frac{11.3\,K\Omega}{0.3\,K\Omega}\right) =$

$= -$

$V_{ADJ\,317} = -1.25\,V = V^- - V_B$

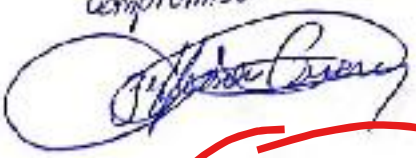
Despejando

$V_B = V^- + 1.25\,V =$

Examn Final

Jefferson Guerrero Gonzalez

Compromiso de honor



67/100

Tema 1

a) $\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$\left[(\bar{A}BC\bar{D} + ABC\bar{D})E + E\right]$

$= \left[\underbrace{(\bar{A}BC\bar{D} + ABC\bar{D})}_{=1} + 1\right]E + E$

$= E$

$\Rightarrow \bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + E$

$\underbrace{(\bar{A}\bar{B}C + A\bar{B}C)}_{X}\bar{E} + E \equiv X\bar{E} + E$ → Propiedad Sin Nombre

$A + \bar{A}B = A + B$

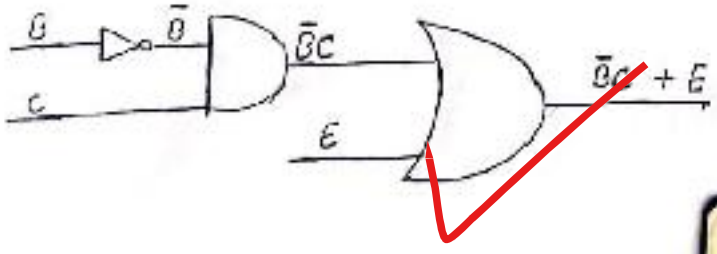
$= X + E$

$(\bar{A} + A)\bar{B}C + E$

$1 \Rightarrow \bar{B}C + E$

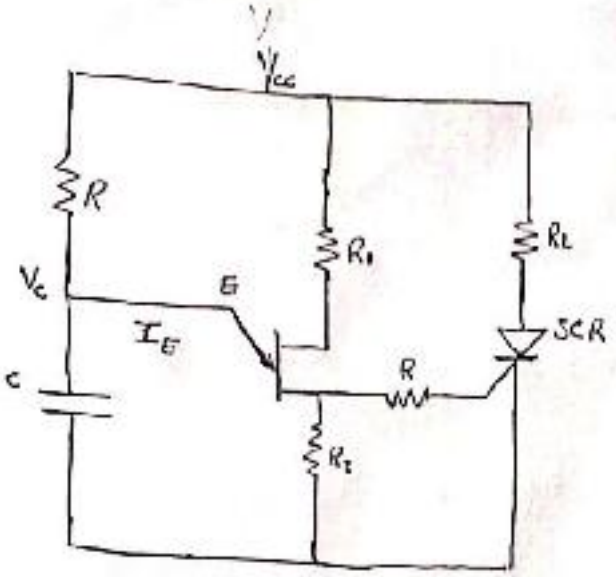
+20p

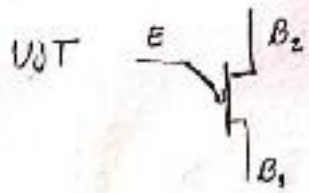
b)



+13p

3)





$I_{R_1} = I_p = 5\mu A$

$V_E = V_p =$

$$V_{cc} - I_R R - V_E = 0 \quad (\text{Ec } 1)$$

$$\Rightarrow R_1 = \frac{V_{cc} - V_E}{I_R} = \frac{V_{cc} - V_p}{I_p}$$

Punto del Valle

$I_E = I_V = 3mA$

$V_E = V_V = 2V$

Para garantizar encendido, condición

$$R < \frac{V_{cc} - V_p}{I_p}$$

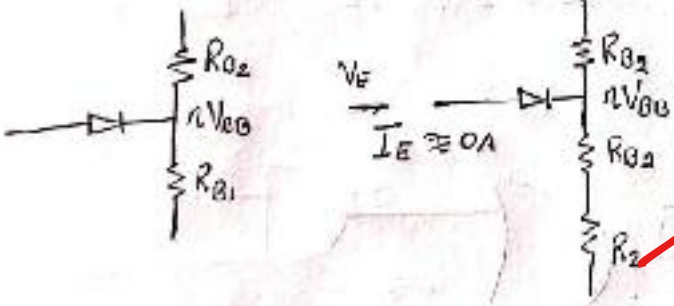
$\Rightarrow$ (Ec 1) nos queda

$$V_{cc} - I_V R - V_V = 0$$

garantizar apagado

$$R = \frac{V_{cc} - V_V}{I_V R} \qquad R > \frac{V_{cc} - V_V}{I_V}$$

Circuito equivalente de UJT



Entonces

$$\frac{V_{cc} - V_V}{I_V} < R < \frac{V_{cc} - V_p}{I_p}$$

$$\Rightarrow \frac{(28 - 2)V}{3mA} < R < \frac{(28 - 20)V}{(5 \times 10^{-3})mA}$$

$$\Rightarrow 8.66k\Omega < R < 1600\Omega$$

cálculo de V_p

$V_p = V_D + \eta V_{BB}$

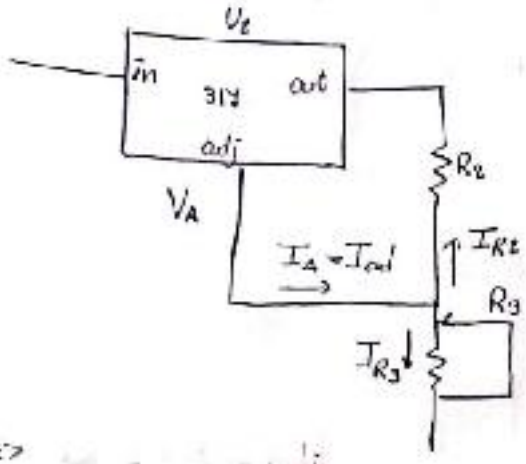
$V_p = 0.5 + (0.7)(28)$

$V_p = 20V$

Voltaje de carga del capacitor

$$V_c = V_V + (V_{cc} - V_V)(1 - e^{-t/RC})$$

Tema 3



$\Rightarrow I_A = I_{R2} + I_{R3}$

$\Rightarrow I_{R3} = I_A - I_{R2}$; $I_{R2} = \frac{V_{adj}}{R_2}$

$\Rightarrow I_{R3} = \frac{V_{adj}}{R_2}$

$I_{adj} \approx 0$

$V_{adj} \approx 1.3\ V$

R_2 datasheet

$I_{R3} = \frac{1.3\ V}{120\ \Omega}$

$I_{R3} = 0.0108\ A = 10.8\ mA$

$\Rightarrow V_{R3} = I_{R3} R_3 = (0.0108)(330\ \Omega)$

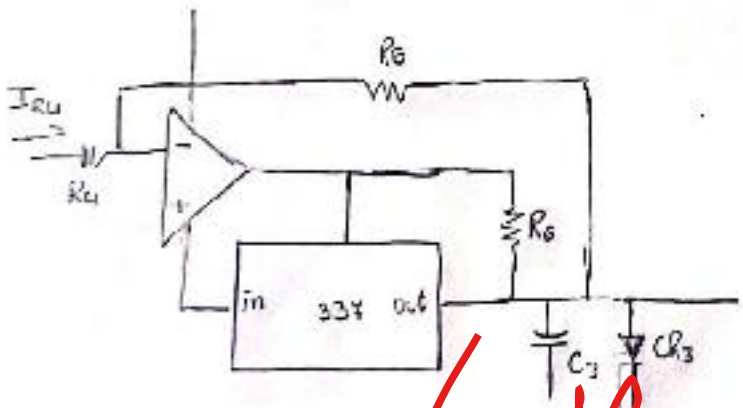
$V_{R3} = 3.564\ V$

$V_{adj} + V_{R3} = 1.3 + 4.104$

$= 5.404\ V$

+3,5p ✓ +4p ✓ +4p ✓

Vamos



$I_{R4} R_4 + V_{in} - V_{out} = 0$

$\Rightarrow I_{R4} = \frac{V_{out}}{R_4}$

$I_{R4} = \frac{5.404}{4.7\ k}$

$I_{R4} = 1.15\ mA$

+4p ✓ +4p ✓

$I_{R5} = -I_{R4} = 1.15$

$\Rightarrow V_{out} = -V_{out} \frac{R_6}{R_{4a}} = (5.404)\left(\frac{120}{4.7}\right) = -25.53$

$V_6 = 25.53 + V_{adj} = 25.53 + 1.3$

$= -26.83\ V$

Duda la corrección +2p

Facultad de Ingeniería en Electricidad y Computación
Examen Final de Electrónica
2do Término 2021-2022

Alumno: Francheska Ingacio Herrera Paralelo: 2

CAc - 2013 - 108 - Comprometo ética de los estudiantes al momento de realizar un examen escrito de la ESPOL

Compromiso de Honor

Reconozco que el presente debe ser desarrollado para ser resuelto de manera individual y no se permite la ayuda de ningún medio no autorizado ni copiar. Firmo al pie del presente compromiso, como constancia de haberlo leído y aceptar la declaración anterior.

Francheska Ingacio

63/100

PRIMER TEMA

En el siguiente problema, realizar la sgt. expresión lógica usando álgebra de Boole

$$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}\bar{E} + E$$

a) La expresión lógica minimizada.
b) Simplemente la expresión mínima encontrada en el literal a usando una única compuerta OR, AND y NOT

MÉTODO 1

$\bar{A}C(\bar{B}\bar{E} + B\bar{D}\bar{E}) + A\bar{B}C\bar{E} + E(A\bar{B}C\bar{D} + 1)$

$\bar{A}C(\bar{B}\bar{E} + B\bar{D}\bar{E}) + A\bar{B}C\bar{E} + E$

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}\bar{E} + A\bar{B}C\bar{E} + E$

$C(\bar{A}\bar{B}\bar{E} + A\bar{B}\bar{E}) + E(A\bar{B}C\bar{D} + 1)$

$C(\bar{A}\bar{B}\bar{E} + A\bar{B}\bar{E}) + E$

$B\bar{C}\bar{E}(\bar{A} + A) + E$

$\bar{B}C\bar{E} + E$

$= E + \bar{B}C$ // ⇒ Expresión lógica minimizada

MÉTODO 2

$AC(\bar{B}\bar{E} + B\bar{D}\bar{E}) + AC(\bar{B}\bar{E} + B\bar{D}\bar{E}) + E$

$C(\bar{B}\bar{E} + B\bar{D}\bar{E}) + E$

$B\bar{C}\bar{E} + BC\bar{D}\bar{E} + E$

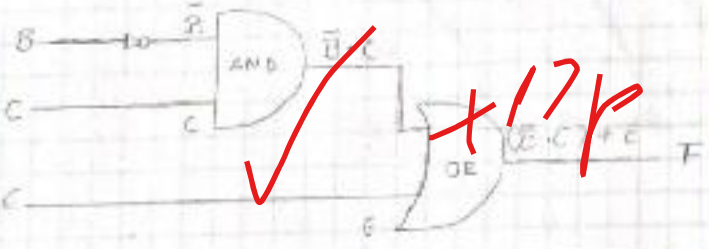
$\bar{B}C\bar{E} + E(B\bar{C}\bar{E} + 1)$

$\bar{B}C\bar{E} + E$

$= E + \bar{B}C$ //

+20p

Implementación



+17p

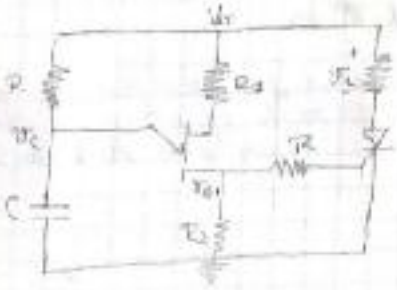
$F = \bar{B}C + E$

2) Considerando que el circuito dela onda:

a) Determinar los valores de R_2 para que este en estado de 10 ms
b) Graficar las señales $V_L(t)$, $V_C(t)$, $V_{RL}(t)$

Datos: $n = 0.1$, $R_{BB} = 6[k\Omega]$, $V_D = 0.5[V]$, $I_P = 5[\mu A]$, $I_V = 3[mA]$, $V_C = 20[V]$

$R_{B1}(en) = 100[\Omega]$ $V_{CC} = 28\ V$, $R_1 = 100[\Omega]$, $R_2 = 47[\Omega]$, $R_L = 40[\Omega]$



$V_p = V_D + \eta V_{CC}$
$V_p = 0.5 + (0.1)(28)$
$V_p = 20.1\ V$

$\frac{V_{CC} - V_V}{I_V} \angle R \angle \frac{V_{CC} - V_P}{I_P}$

$\frac{28 - 24}{3 \times 10^{-3}} \angle R \angle \frac{28 - 20.1}{5 \times 10^{-6}}$

$1.33[k\Omega] \angle R \angle 1.6\ [M\Omega]$

Debido a que el tiempo de descarga es mucho menor que el de carga

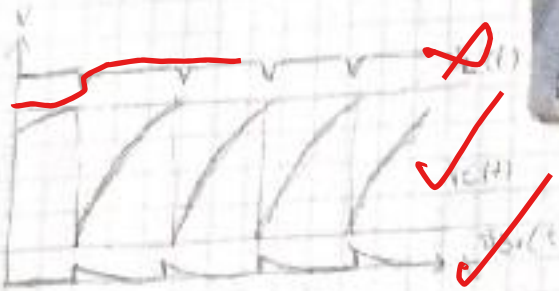
$T = t_{ON}$
$R = 100\ K\Omega$

$t_{ON} = RC \ln\left(\frac{V - V_V}{V - V_P}\right)$

$10ms = (100k)(C) \ln\left(\frac{28 - 24}{28 - 20.1}\right)$

$C = 0.089\ \mu F$

$R = 100\ K\Omega$
$C = 0.089\ \mu F$



f2wp

f10p

Giuseppe Steven Imbaquingo Camacho Parcial 2 25/04/2022

Compromiso de honor

Declaramos que el presente taller está diseñado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copiar. Firmo al pie del presente compromiso [illegible] haber leído y aceptar la de [illegible]

Firma

Primer tema

a) Expresión lógica Mediante barra

ÁLGEBRA DE BOOLE

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + AB\bar{C}\bar{D}E + E$

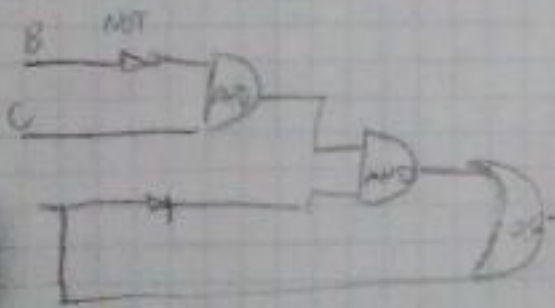
$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + AB\bar{C}\bar{D}E + E$

$\bar{B}C\bar{E}(\bar{A}+A) + BC\bar{D}E(\bar{A}+1) + E$

$\bar{B}C\bar{E} + BC\bar{D}E + E$

$E(BC\bar{D}+1) + \bar{B}C\bar{E}$

$E + \bar{B}C\bar{E}$



100

+1 sp

= E + B̄C

+7 sp

TEMA 2

$\eta = \frac{R_{b1}}{R_{bb}} \rightarrow R_{b1} = \eta R_{bb}$

$R_{b1} = (6K)(0.7)$

$R_{b1} = 4.2K$

$R_{bb} = R_{b1} + R_{b2}$

$\hookrightarrow R_{b2} = R_{bb} - R_{b1} = (6K) - (4.2) = 1.8K$

$$V_c = V_b + \frac{V_{cc}(R_{b1} + R_2)}{\frac{R_{b1} + R_{b2}}{R_{bb}} + R_1 + R_2}$$

$$V_c = 0.5 + 28\left(\frac{4.2K + 0.047K}{6K + 0K + 0.047K}\right)$$

$V_c = 20V$

$\frac{V_{cc} - V_{cc}}{R} > 0$ ✓ $\quad \frac{V_{cc} - V_c}{R} < I_v$ ✓

$R < \frac{V_{cc} - V_c}{I_v}$ $\quad R > \frac{V_{cc} - V_c}{I_v}$

$R_2 = \frac{2.1}{5\mu A} = 1.6M$ $\quad R_2 = \frac{(28) - 1}{2mA}$

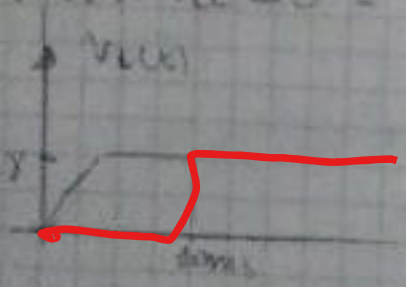
$R_2 = 3.67K$

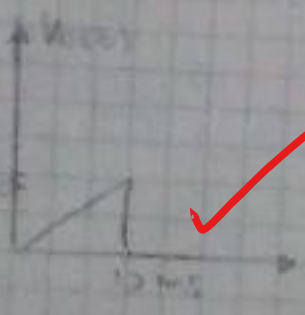
4p

$t_R = -RC\ln\left(\frac{V_{cc} - V_c}{V_{cc} - 0}\right)$ $\quad R_2 \approx \frac{R_{b1} + R_{b2}}{2} = 0.8\,m\Omega$

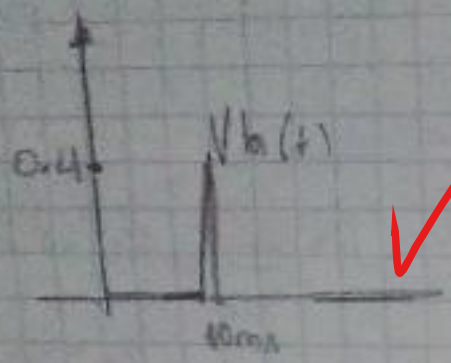
$C = -\frac{t_R}{R\ln\left(\frac{V_{cc} - V_c}{V_{cc} - 0}\right)} = -\frac{40\,ms}{(0.8)\ln\left(\frac{28 - 1}{28}\right)} = 50mF$

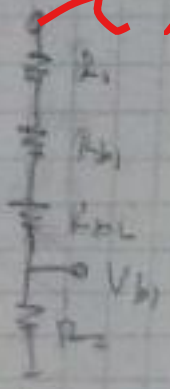
$V_L(t) = V_{cc} - 0 = 28$





✓ +5p



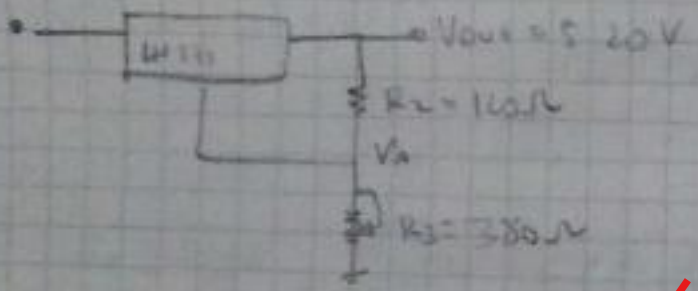


$V_{b1} = \frac{2R_2}{R_{b1} + R_1 + R_2}$

$V_{b1} = 0.21V$

ESP

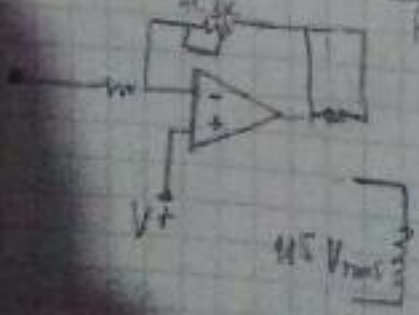
TEMA 3



$V_{adj} = 1.25V \rightarrow V_{R_2} = 1.25V$ ✓

$V_{R_3} = 1.25V \left(\frac{380}{140}\right) = 3.45V$ ✓ +1p

$V_{out} = V_{R_2} + V_{R_3} = 1.25 + 3.45 = 5.20V$ ✓ +1p



$I_{R_3} = \frac{V_{R_3}}{R_3} = \frac{3.45}{0.38k} = 10.4mA$ ✓ +1p

$V^- = V^+$ ✓ +1p

$V_p = 11.5\sqrt{2}$ $V_s = \frac{11.5\sqrt{2}}{2}$

$V_s = 8.1$

$V^+ = V_{in} = 8.1 \cdot 2$ +1p

$$I_1 = I_2$$

$$\frac{5.20 - V^-}{4.7K} = \frac{V^- - V_{OUTINV}}{11.3K}$$

$$V_{OUTINV} = -5.20\left(\frac{11.3K}{4.7K}\right) + V^+\left(1 + \frac{11.3K}{4.7K}\right)$$

$$V_{OUTINV} = -12.5 + 81.31\left(1 + \frac{11.3K}{4.7K}\right)$$

$$* \quad V_{OUTINV} = 264.3V \;//$$

$$* \; I_{R4} = \frac{5.21 - 81.31}{4.7K} = -16.19mA \;//$$

$$* I_{R5} = \frac{81.31 - 264.2}{11.3} = -16.19mA \;//$$

$$* \; V_D = 81.31 - 264.3 = -182.99 \;//$$

Nombre: Cristhian Macay Paralelo:

Examen Final

Macay

Firma Compromiso

Tema 1:

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

a) $(\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + [E + (\bar{A}\cdot B\cdot C\cdot\bar{D}\cdot E)] + (A\cdot\bar{B}\cdot C\cdot\bar{E}) + (A\cdot B\cdot C\cdot\bar{D}\cdot E) =$

A^* B^* A^*

→ Teorema de absorción: $A + A\cdot B = A$

$(\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + E + (A\cdot\bar{B}\cdot C\cdot\bar{E}) + (A\cdot B\cdot C\cdot\bar{D}\cdot E) =$

$(\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + (A\cdot\bar{B}\cdot C\cdot\bar{E}) + [E + (A\cdot B\cdot C\cdot\bar{D}\cdot E)] =$

A^* B^* A^*

$(\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + (A\cdot\bar{B}\cdot C\cdot\bar{E}) + E = (\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + [E + (\bar{E}\cdot A\cdot\bar{B}\cdot C)]$

↳ ley conmutativa

A^* B^*

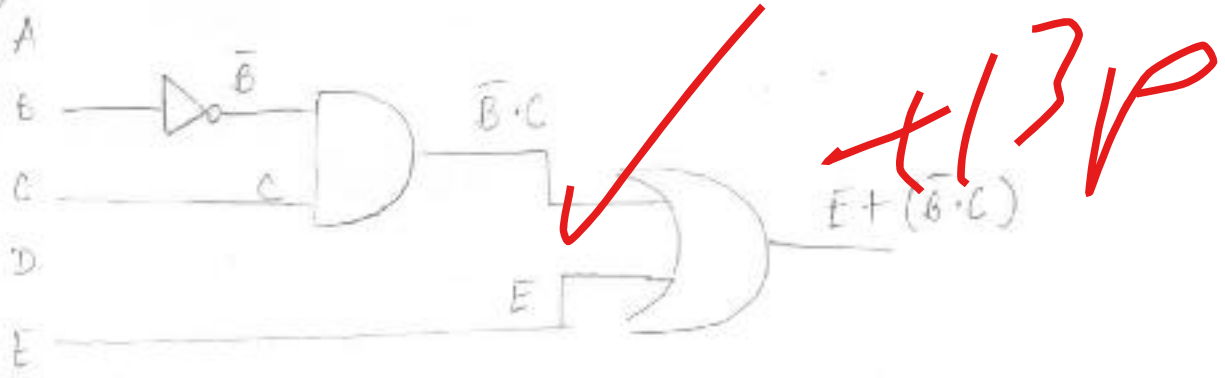
$A + \bar{A}B = A + B$

$= (\bar{A}\cdot\bar{B}\cdot C\cdot\bar{E}) + [E + (A\cdot\bar{B}\cdot C)] = E + (\bar{E}\cdot\bar{A}\cdot\bar{B}\cdot C) + (A\cdot\bar{B}\cdot C)$

$= E + (\bar{A}\cdot\bar{B}\cdot C) + (A\cdot\bar{B}\cdot C)$

$= E + [\bar{B}\cdot C(\underbrace{\bar{A} + A}_{1})] = E + [\bar{B}\cdot C]$ //

b)



52/100

+20p

+13p

Tema 2:

Tema 1:- Valores R y C para un retardo de 2 ms

UJT

$\eta = 0.7$; $R_{BB} = 6\ K\Omega$; $V_D = 0.5\ V$

$I_P = 5\mu A$; $I_V = 3mA$, $V_V = 2\ V$

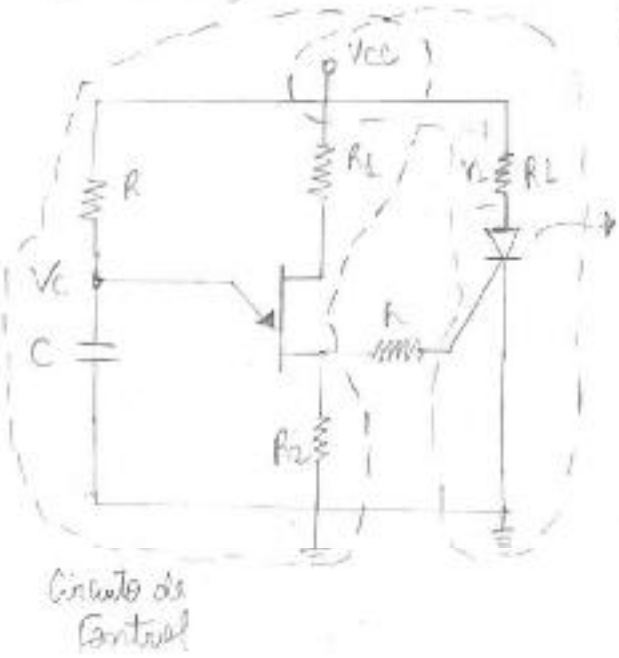
$R_{B1(sat)} = 100\ \Omega$; $V_{CC} = 28\ V$; $R_1 = 100\ \Omega$

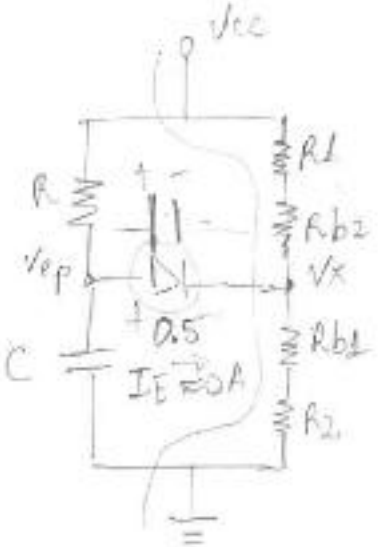
$R_2 = 47\ \Omega$; $R_L = 20\ \Omega$

$T = 0.01\ s$

$\frac{1}{f} = 0.01\ s$

$f = 100\ Hz$





$R_{BB} = R_{b2} + R_{b1}$

$R_{B1OFF} = \eta R_{BB} = (0.7)(6K\Omega) = 4.2\ K\Omega$

$R_{B1ON} = 100\ \Omega$

$$V_{ep} = 0.5 + \frac{(R_{B1_{off}} R_2) V_{CC}}{\underbrace{R_{B1} + R_{B2} + R_1 + R_2}_{R_{BB}}}$$

$$V_{ep} = 0.5 + \frac{(1.2K\Omega + 47\Omega)(28V)}{(6K\Omega) + (100\Omega + 47\Omega)} = 19.84\ V$$

$V_{ep} = V_C$, al existir una resistencia con el capacitor, existirá su comportamiento es exponencial

$$V_C = \frac{1}{C}\int_0^t i_C\,\partial t \qquad \boxed{I_C = I_p}$$

$$V_C = \frac{1}{C}\left[i_C\,(T_F - T_0)\right]$$

$$V_C = \frac{1}{C}\left[i_C\,T_F\right]$$

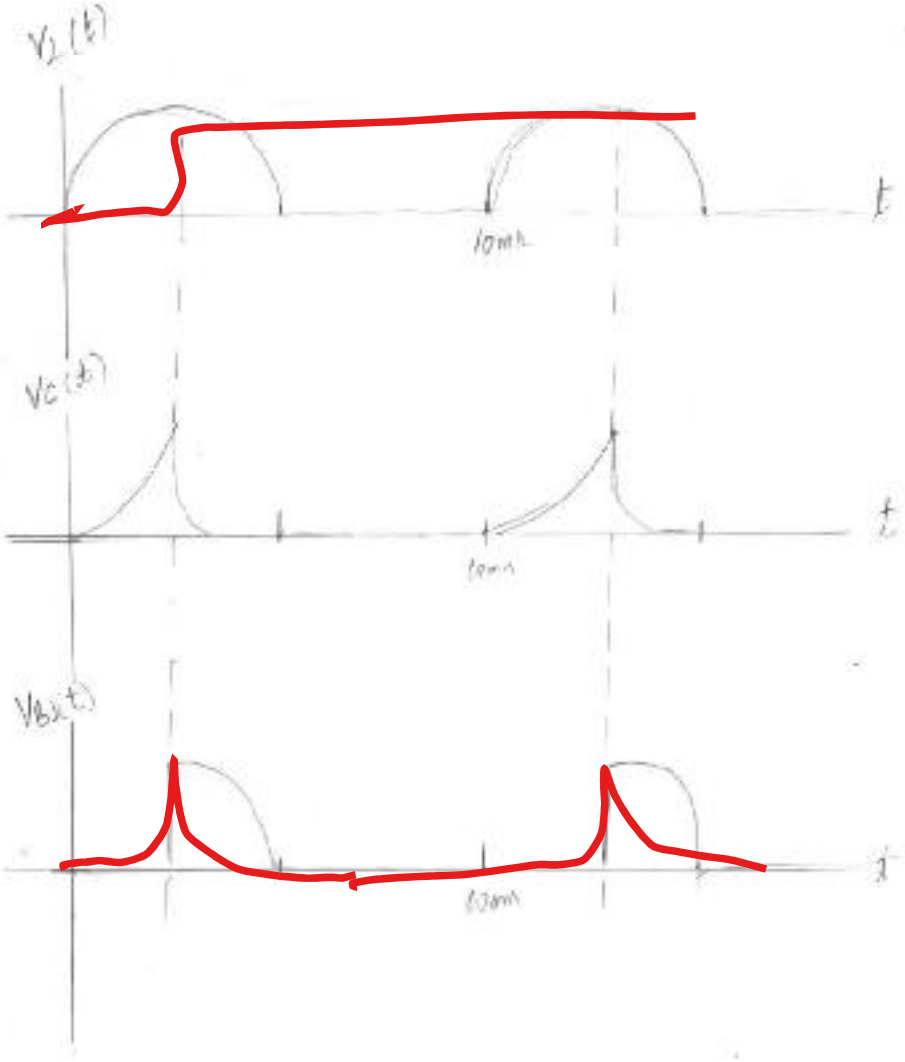
$$C = \frac{1}{V_C}\left[i_C\,T_F\right] = \frac{1}{V_C}\left(i_p\,t_f\right) = \frac{1}{19.84\,V}\,(3\mu A)(4\,ms)$$

$C = 2,52\ nF$ //

$R = \frac{V - V_V}{I_V} = \frac{(28-2)V}{3\,mA} = 8.67\,k\Omega$ // Punto valle

$R = \frac{V - V_P}{I_P} = \frac{(28-19.84)V}{5\mu} = 1.63\,M\Omega$ // Punto pico

+12p ✓



+7p

$V = RI$

Tema 3.-

I_{R3} ; V_{R3}

$+V_{out}$; V^-

V_{U3} inv

I_{R4}

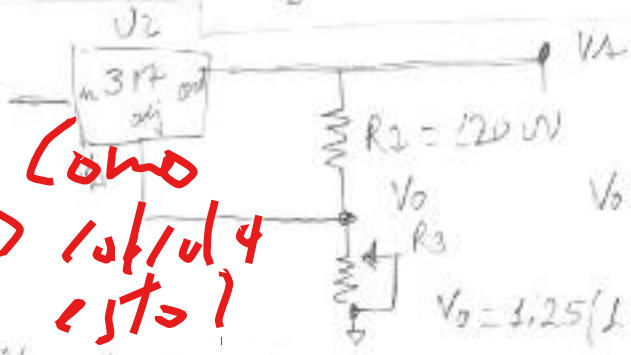
I_{R5}

V_B

$\begin{cases} R_3 = 380\,\Omega \\ R_5 = 11.3\,k\Omega \end{cases}$

$V_{in} = V^+_{out} - V^-$

a)



$V_{R3} = R_3 I_{R3}$

$V_{R3} = 5.246\,V$ //

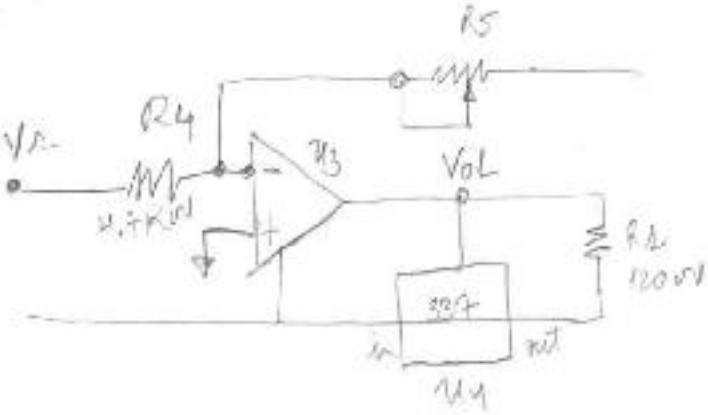
Como calculo esto?

$I_{R3} = \frac{V_{R3}}{R_3} = \frac{5.246\,V}{380\,\Omega} = 13.805\,mA$ //

$V_o = V_{ref}\left(1 + \frac{R_2}{R_2}\right) + I_{adj} R_3$

$V_o = 1.25\left(1 + \frac{380}{120}\right) + (100\,\mu A)(380)$?

$V_o = 5.246\,V$



$I_4 = \frac{V_{A-} - 0}{R_4} = \frac{V_{A-}}{R_4}$

$V_{o1} =$

Fecha: 25 01 2022
Ps851 T2

Luis Andrés Naranjo
P2
2018 01 396

Reconozco que el presente deber está diseñado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copiar. Firmo al pie del presente compromiso, como constancia de haber leído y aceptar la declaración anterior.

Luis Naranjo

76/100

1) a) $\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$\bar{A}\bar{B}C\bar{E} + (\bar{A}BC\bar{D}E + E) + A\bar{B}C\bar{E} + ABC\bar{D}E$

$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + E(\bar{A}BC\bar{D} + 1 + ABC\bar{D})$

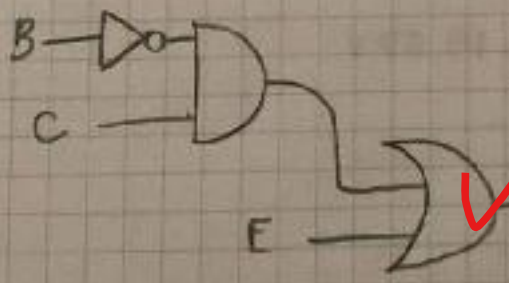
$\bar{E}(\bar{A}\bar{B}C + A\bar{B}C) + E$

$\bar{B}C(\bar{A} + A) + E$

$F = \bar{B}C + E$

+10p

b)



+10p

2)

Datos

$\eta = 0.7$ $\quad V_{cc} = 28V$

$R_{BB} = 6K\Omega$ $\quad R_1 = 100\Omega$

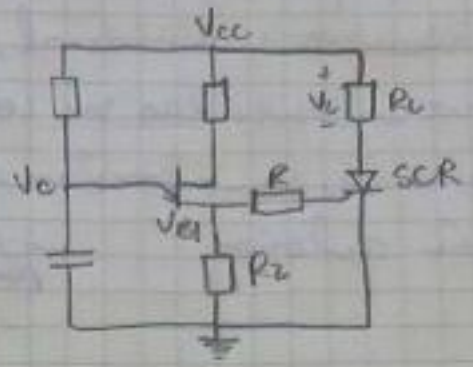
$V_D = 0.5V$ $\quad R_2 = 47\Omega$

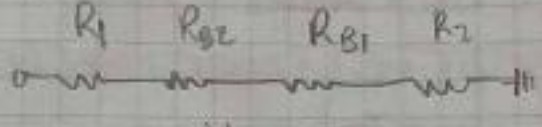
$I_p = 5\mu A$ $\quad R_L = 10\Omega$

$I_v = 3mA$

$V_v = 2V$

$R_{B1(sat)} = 100\Omega$





a)

$R_{B1} = \eta R_{BB} = (0.7)(6\times10^3)$

$R_{B1} = 4.2K\Omega$

$R_{B1} + R_{B2} = 6K \rightarrow R_{B2} = 6 - 4.2$

$R_{B2} = 1.8K\Omega$

$\sqrt{+SP}$

$V_p = V_{RB1} + V_{R2}$

$V_p = \dfrac{28(4.2\times10^3)}{6\times10^3 + 0.1 + 0.047} = 19.59\,V$

$V_c = 28(1 - e^{-\frac{t}{\tau}}) - 19.59$

$\tau = 8.92\,ms$

$RC = 8.92\times10^{-3}$

Fecha: ___/___/___

b) V_L

28

10

t (ms)

V_C

V_E

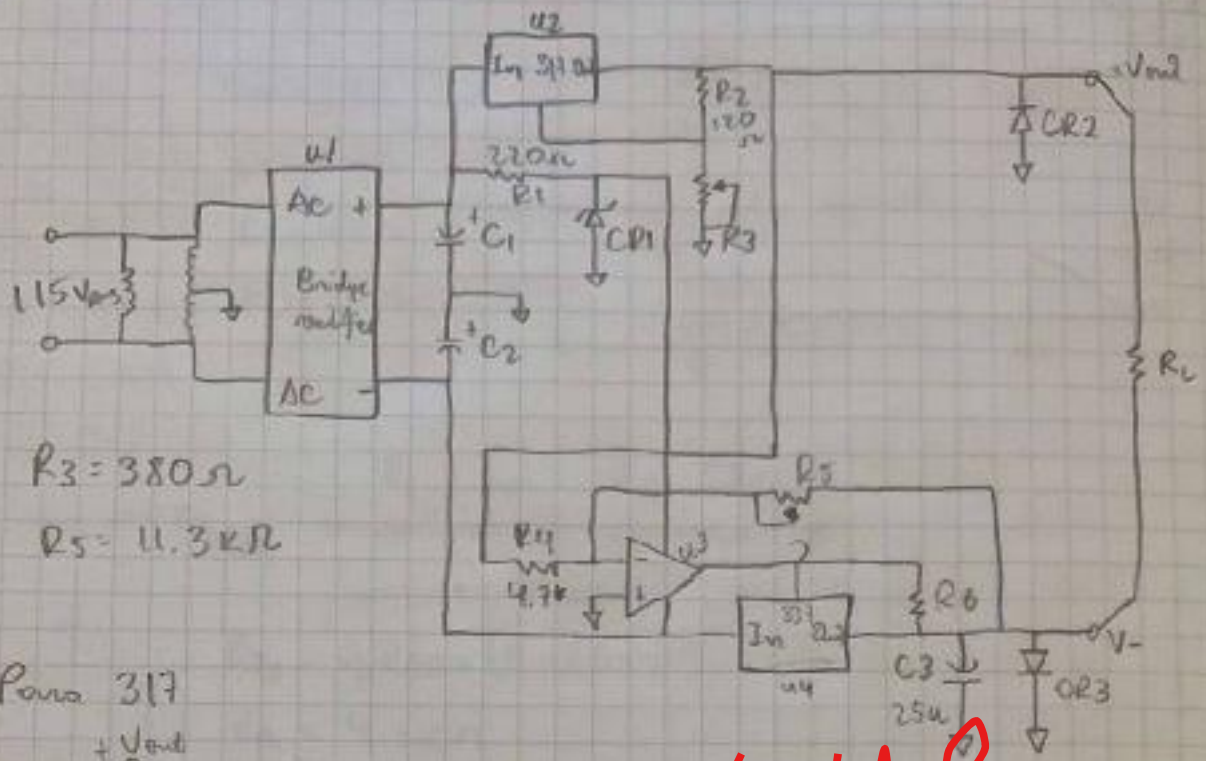
2

10

t (ms)

✓ +1 op

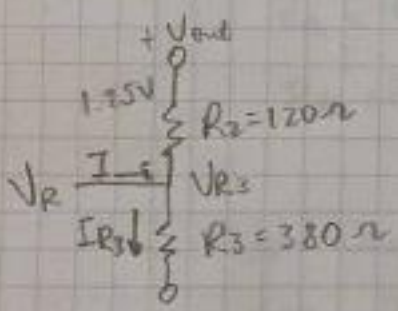
3)



$R_3 = 380\,\Omega$

$R_5 = 11.3\,K\Omega$

Para 317



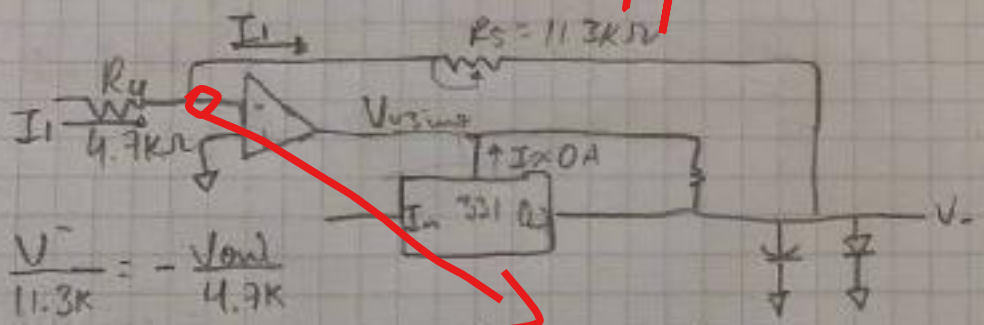
$I \simeq 0$

$I_{R3} = \frac{1.25}{120} = 10.41\ mA$

$V_{R3} = (0.41)(380) = 3.956\ V$

$V_{out} = 1.25 + 3.956$

$V_{out} = 5.206\ V$



$\frac{V^-}{11.3K} = -\frac{V_{out}}{4.7K}$

$V^- = -\frac{11.3K}{4.7K} V_{out}$

$V^- = -12.51\ V$

$V_{uzima} \times V_0 = 1.25 + V^- = 1.25 - 12.51$

$V_{uzima} = V_0 = -11.26\ V$

$I_{R4} = I_{R5} = I_1 = \frac{V_{out}}{4.7K} = \frac{5.206}{4.7K} = 1.107\ mA$

+4p +4p +4p +4p +4p

Panchana Ochoa María Fernanda Paralelo: 2

Examen 2do Parcial

7 9/100

Compromiso de Honor

Reconozco que el presente deber está diseñado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copiar. Firmo al pie del presente compromiso como constancia de haber leído y aceptar la declaración anterior.

María Panchana O.

Primer Tema:

- Reducir la expresión usando Álgebra de Boole:

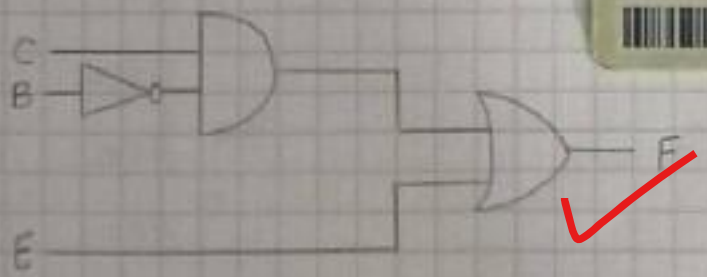
$$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$$

a) Expresión lógica minimizada

$$F = \bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$$
$$F = A\bar{B}C\bar{E} + (\bar{A}BC\bar{D}E + ABC\bar{D}E + E) + A\bar{B}C\bar{E}$$
$$F = \bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + E(\bar{A}BC\bar{D} + ABC\bar{D} + 1)$$
$$1$$
$$F = \bar{E}(\bar{A}\bar{B}C + A\bar{B}C) + E$$
$$F = \bar{A}\bar{B}C + A\bar{B}C + E$$
$$F = \bar{B}C(\bar{A} + A) + E$$
$$1$$
$$F = \bar{B}C + E$$

+20p

b) Implementación de la expresión



+30p

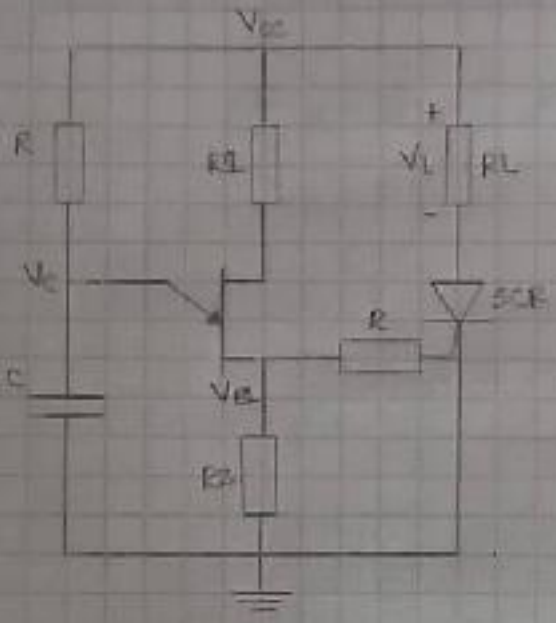
Panchana Ochoa Maria Fernanda Paralelo 2

Examen 2do Parcial

Segundo Tema

- Considerando que el circuito debe estar

a) Determinar valores de R, C para retardo de 10 ms



Datos

$\eta = 0.7$
$R_{BB} = 6K\Omega$
$V_D = 0.5V$
$I_p = 5\mu A$
$I_v = 3mA$
$V_v = 2V$
$R_{B1(on)} = 100\Omega$

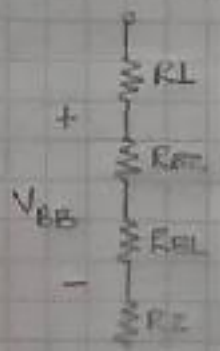
$V_{CC} = 28V$
$R1 = 100\Omega$
$R2 = 47\Omega$
$RL = 10\Omega$

▸ $R_{BL} = \eta R_{BB} = (0.7)(6K\Omega) = 4.2K\Omega$ // $\rightarrow R_{BL} = 4.2K$ //

▸ $V_p = V_{RBL} + V_{BL} \rightarrow V_p = \frac{V_{CC} \cdot R_{BL}}{R_{BB}+R_1+R_2} = \frac{28 \cdot 4.2}{6K+0.1+0.047} = 19.59V$

▸ $V_c = 28(1-e^{-\frac{10}{T}}) = 28(1-e^{-\frac{10}{6m}}) = 19.28$

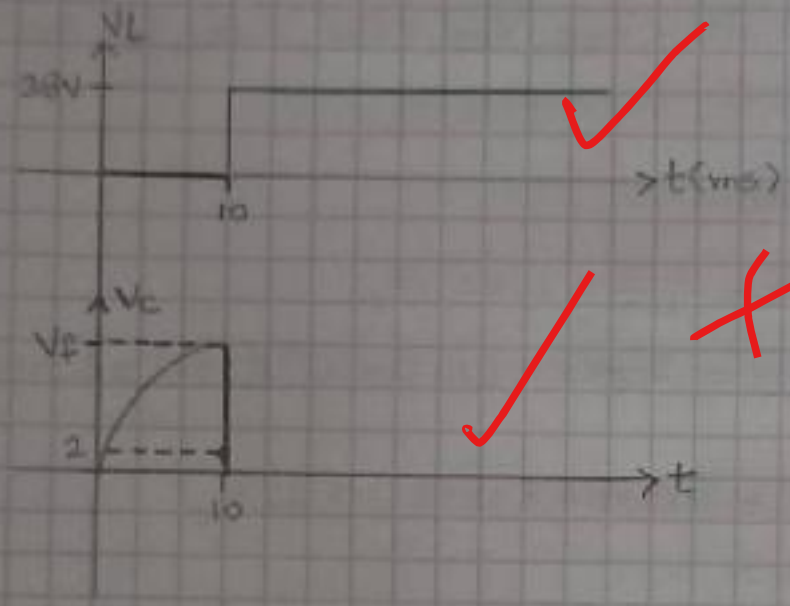
$T = 8.69ms \rightarrow RC = 8.69 \times 10^{-3}$ //



Panchana Ochoa Maria Fernanda Paralelo 2

Examen 2do Parcial

b) Grafcar las formas



+10p

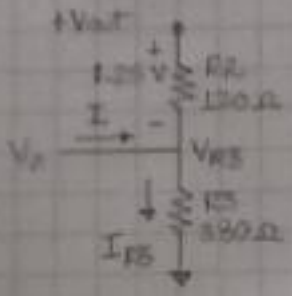
Panchana Ochoa María Fernanda Paralelo 2

Examen 2do Parcial

Tercer Tema

- Dado el circuito, calcular: I_{R3}, V_{R3}, $+V_{out}$, V_{salida}, I_{R4}, I_{R5}, V^-, V_B

► LM 317

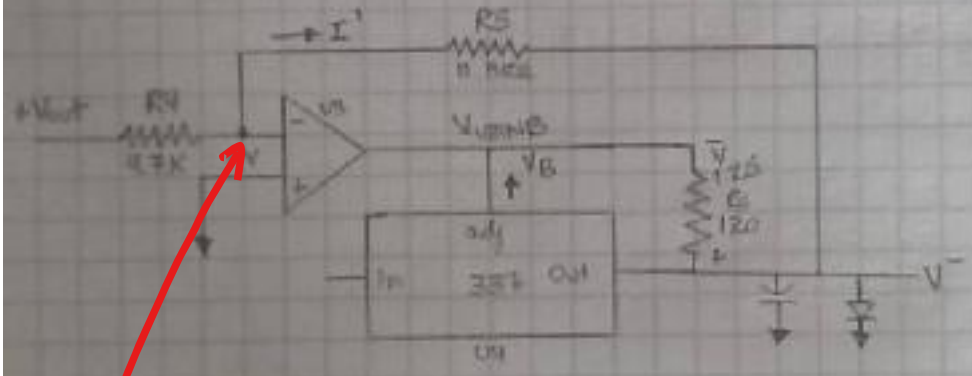


$I = 0$

► $I_{R3} = \frac{1.25}{120} = 10.42\ mA_{//}$ ✓ +4p

► $V_{R3} = I_{R3} R3 = (10.42 \times 10^{-3})(390) = 3.9558\ V_{//}$ ✓ +4p

► $V_{out} = 1.25 + 3.9558$ ✓ 5.21 $V_{//}$ +4p



$\frac{V^-}{R5} = -\frac{V_{out}}{R4} \Rightarrow V^- = -\frac{(R5)(V_{out})}{R4} = -\frac{11.3K(5.21)}{4.7K} = -12.52\ V_{//}$ ✓ +4p

► $I_{R4} = I_{R5} = I' = \frac{V_{out}}{4.7} \Rightarrow \frac{5.21}{4.7} = 1.11\ mA_{//}$ ✓ +4p

► $V_{LIMINE} \times V_B = 1.25 + V^- = 1.25 - 12.52.6 = -11.276\ V_{//}$ ✓ +4p

Nombre: Jhoffre Ramirez 25 01 22

76/100

Compromiso de honor

Reconozco que el presente deber esta diseñado para ser resuelto de manera individual y no se permite la ayuda de fuentes no autorizadas ni copias. Firmo al pie del presente compromiso como constancia de haber leido y aceptar la declaración anterior.

Jhoffre Ramirez
Firma de compromiso

Primer Tema

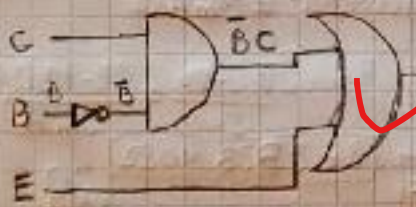
(A) $F = \bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}CE + ABC\bar{D}E + E$

$F = (\bar{A}BC\bar{D}E + E) + A\bar{B}C\bar{E} + A\bar{B}C\bar{D}E + \bar{A}\bar{B}C\bar{E}$ +2p

$F = \bar{A}\bar{B}C\bar{E} + E(\bar{A}BC\bar{D} + 1 + A\bar{B}C\bar{D}) + A\bar{B}CE$

$F = \bar{E}(\bar{A}\bar{B}C + A\bar{B}C) + EF = \bar{B}C(\bar{A} + \bar{A}) + E = \bar{B}C + E = F$ 1/R

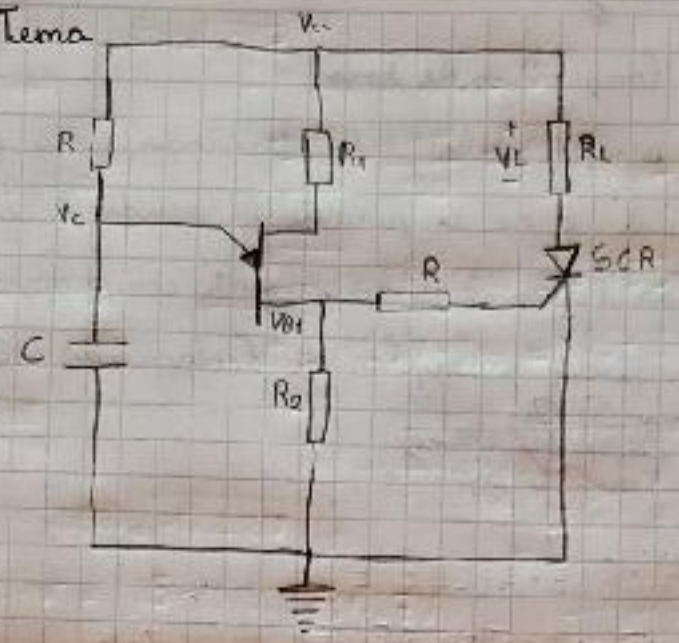
(B)



$F = \bar{B}C + E$ +1p

Segundo Tema

ⓒ



ⓐ $R_{B1} = \eta R_{BB} = 0,6(6K)$ $R_{B1} = 4,2K\Omega$ $R_{B2} = 1,8K$

$V_P = V_{RB1} + V_D$ $V_P = \frac{28(4,2K)}{6K + 0,1 + 0,04} = 19,131V$

$V_C = 28(1 - e^{-\frac{t}{RC}}) = 19,13$

$T = 10ms$ $RC = 10 \times 10^{-3}$

$R_{max} = \frac{28 - 2}{3mA} = 8666,67\Omega$

$R_{max} = \frac{V_{cc} - V_P}{I_P} = \frac{28 - 19,13}{5m A} = 1,7K\Omega$

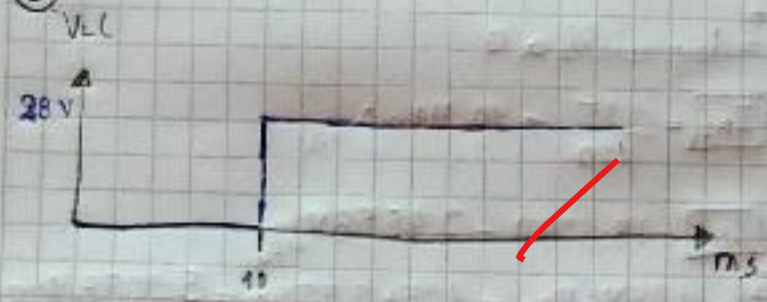
$R = 3838,40\Omega$ //R

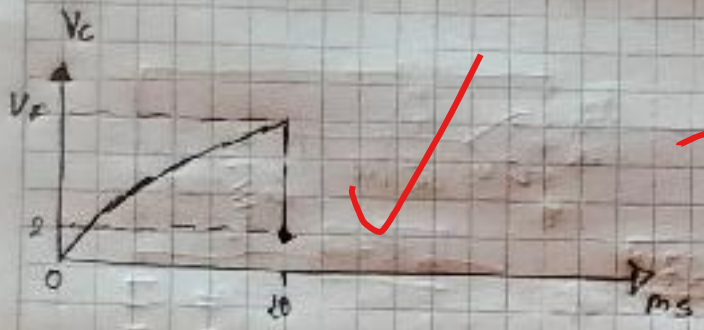
$C = \frac{10 \times 10^{-3}}{3838,40\Omega} = 2,6\mu F$ //R

$R = 3838,4\Omega$ //R $C = 2,6\mu F$

8,6K < 38K ?

b)


VL
28 V
10
ms


Vc
Vf
2
0
10
ms

✓

✓

+10p


REPÚBLICA DEL ECUADOR
CÉDULA DE CIUDADANÍA
No. 020179353-6
APELLIDOS Y NOMBRES
RAMIREZ SINABRIA
JHOFFRE EDUARDO
BOLIVAR
GUARANDA
ANGEL POLIBIO CHAVES
SEXO HOMBRE

Tercer Tema

En el 317

I = despreciable ≈ 0

$I_{R3} = \frac{1.25}{120} = 10.41\ mA$ //R ✓ +4P

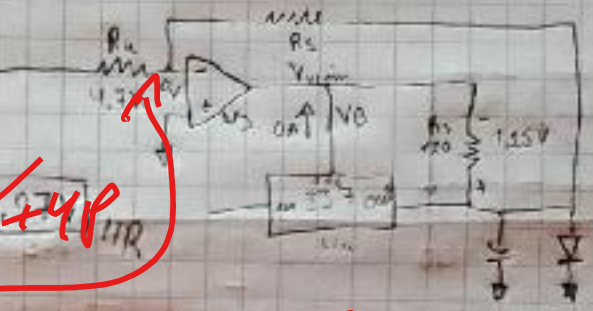
$V_{R3} = I_{R3}(380) = 3.9558V$ //R ✓ +4P

$V_{out} = 1.25V + V_{R3} = 1.25 + 3.9558 = 5.2058V$ //R ✓ +4P

$\frac{V^-}{11.3K} = -\frac{V_{out}}{4.7K}$

$V^- = \frac{11.3}{4.7}(5.2058) = -12.52V$ //R ✓ +4P

$V_B = V_{VSINV} = 1.25 + V^- = 1.25 - 12.52 = -11.27V$ //R ✓ +4P



$I_{R4} = I_{R5} = I' = \frac{V_{out}}{4.7K} = \frac{5.2058}{4.7K} = 1.10\ mA$ //R ✓ +4P

+4P

$I_{R3} = 10.41\ mA$

$V_{R3} = 3.9558V$

$V_{out} = 5.2058V$

$V^- = -12.52V$

$V_C = -11.27V$

$V_{VSINV} = -11.27V$

$I_{R4} = 1.10\ mA$

$I_{R5} = 1.10\ mA$

25/01/202

Examen Final de Electrónica

Milena Riquero
Paralelo 2

77/105

COMPROMISO DE HONOR.

Reconozco que el presente deber está diseñado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copiar. Firmo al pie del presente compromiso, como constancia de haber leído y aceptar la declaración anterior.

Milena Riquero.
Firma de Compromiso del Estudiante.

Tema 1.

(~~ABCE + ABCDE~~)

a)

$\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + AB\underbrace{C\bar{D}E}_{E} + E$

$\bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + \bar{A}\underbrace{BC\bar{D}E}_{E} + E$

$\bar{A}\bar{B}C\bar{E} + \underbrace{A\bar{B}C\bar{E} + E}$

$\bar{A}\bar{B}C\bar{E} + A\bar{B}C + E$

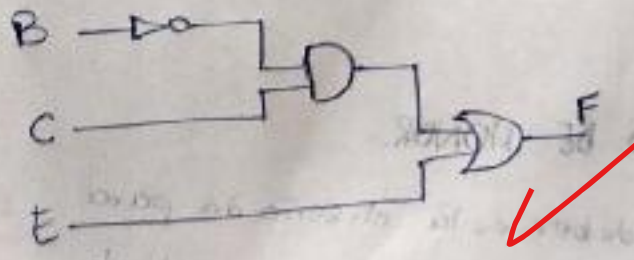
$\bar{A}\bar{B}C + A\bar{B}C + E$

$\bar{B}C(\underbrace{\bar{A} + A}_{1}) + E$

$\bar{B}C + E$ #.

✓ +20p

b)



+12p

Tema 2

Datos:

$\eta = 0,7$

$R_{BB} = 6\,k\Omega$

$V_D = 0,8\,V$

$I_p = 5\,\mu A$

$I_v = 3\,mA$

$V_v = 2\,V$

$R_{B1(on)} = 100\,\Omega$

$V_{cc} = 28\,V$

$R_1 = 100\,\Omega$

$R_2 = 47\,\Omega$

$R_L = 10\,\Omega$

$t = 10\,ms$

a)

$$V_p = V_D + \eta V_{cc}$$

$$= 0,54 + (0,7)(28V)$$

$$V_p = 20,1\,V$$

$$\frac{V - V_v}{I_v} < R < \frac{V - V_p}{I_p}$$

$$\frac{28 - 2}{3mA} < R < \frac{28 - 20,1}{5\mu A}$$

$$8,67\,k\Omega < R < 1,58\,M\Omega$$

Se asume que $R_1 = 30\,k\Omega$, que se encuentra dentro del intervalo obtenido.

$$t = R C \ln\left(\frac{V - V_v}{V - V_p}\right)$$

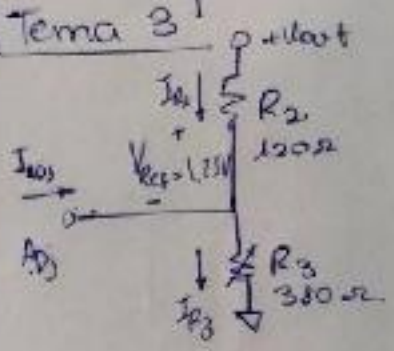
$$C = \frac{t}{R \ln\left(\frac{V - V_v}{V - V_p}\right)}$$

$$C = \frac{10ms}{(30k\Omega)\ln\left(\frac{26}{7,1}\right)} = [illegible]$$

$$C = 0,168\,\mu F$$

+20p

Tema 3



LM317

$I_{ADJ} \simeq 0$

$I_{R2} \simeq I_{R3}$

$I_{R2} \simeq I_{R3} = 10,42\ mA$ //

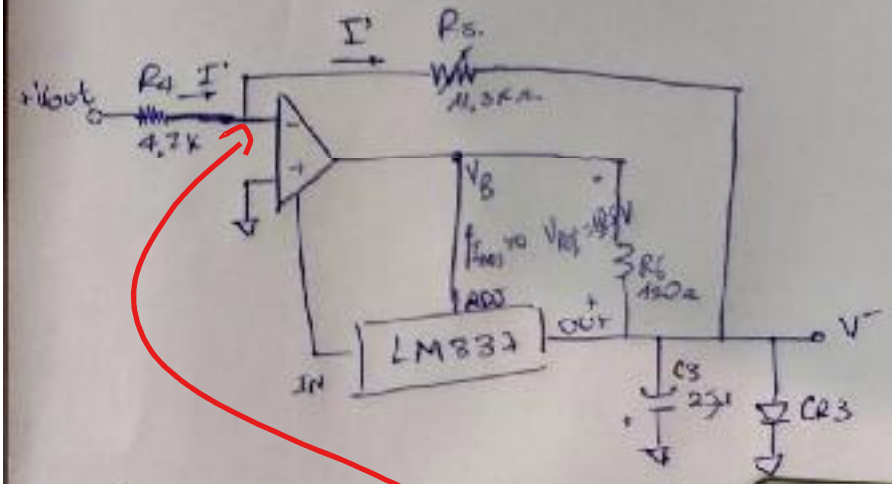
$I_{R2} = \frac{1,25}{120} = 10,42\ mA$ ✓ +4p

$V_{R3} = I_{R3}(380) = (10,42m)(380)$ ✓

$V_{R3} = 3,96\ V$ ✓ +4p

$V_{out} = 1,25\left(1 + \frac{R_3}{R_2}\right)$

$= 1,25\left(1 + \frac{380}{120}\right) = 5,21\ V$ // ✓ +4p



$\frac{V^-}{11,3k} = -\frac{V_{out}}{4,7k}$

$V^- = -V_{out}\left(\frac{11,3k}{4,7k}\right) =$

$= -(5,21)\left(\frac{11,3k}{4,7k}\right) =$

$V^- = -12,53\ V$ // ✓ +4p

$I_{R4} = I_{R5} = I'$ ✓

$I' = \frac{V_{out}}{4,7k} = 1,11\ mA$ ✓ +4p

$V_{DSINV} \times V_B$

$V_B = V_{Ref} + V^-$

$= 1,25 + (-12,53)$

$= -11,276\ V$ // ✓ +4p

Examen Final

Tutiven Reyes Jesus

Reconozco que el presente debe estar diseñado para ser resuelto de manera individual y no se permite la ayuda de fuentes no autorizadas ni copias. Firmo al pie del presente compromiso como constancia de haber leído y aceptar la Declaración [illegible]

81/100

1)

a) $\bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{E} + ABC\bar{D}E + E$

$E(\bar{A}\bar{B}C + A\bar{B}C) + E(\bar{A}BC\bar{D} + ABC\bar{D}) + E$

M'

$\bar{E}M + EBC\bar{D}(\bar{A}+A)' + E$

$\bar{E}M + EBC\bar{D} + E$

$\bar{E}M + E(BC\bar{D} + 1)$

$\bar{E}M + E(1)$

$\bar{E}M + E = M + E$

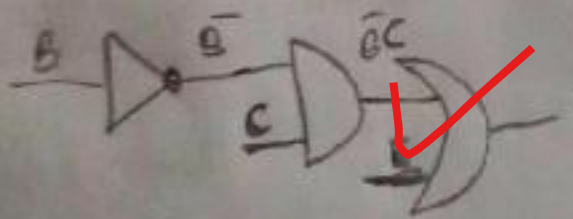
$(\bar{A}\bar{B}C + A\bar{B}C)' + E$

$\bar{B}C(\bar{A}+A)' + E$

$\bar{B}C + E$

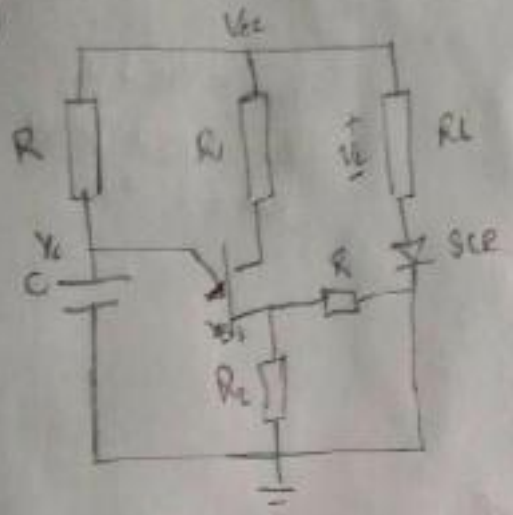
+20p

b)



$BC + E$ +13p

2)



$\eta = 0.7$
$R_{BB} = 6$
$V_{cc} = 28$
$V_b = 0.5$
$I_p = 5\mu A$

$I_v = 3\,mA$
$V_v = 2V$
$R_{B1\,(min)} = 100\Omega$
$R_1 = 100\Omega$
$R_2 = 4\Omega$
$RL = 10\Omega$

$$V_p = 0.5 + \frac{(R_{B1} + R_2)(28)}{R_{BB} + R_2}$$

$$V_p = 0.5 + \frac{(0.1K + 0.047K)(28)}{6K + 0.047}$$

$V_p = 1.18\,V$

a) $t = R\,C \log_e \frac{V - V_0}{V - V_p}$

$$RC = \frac{t}{\log_e\left(\frac{28-2}{28-1.18}\right)}$$

$$RC = \frac{10\,ms}{\ln\left(\frac{28-2}{28-1.18}\right)} = 0.312$$

$R = 100k\Omega$

$C = \frac{0.312}{100\times10^3} = 3.12\,MF$

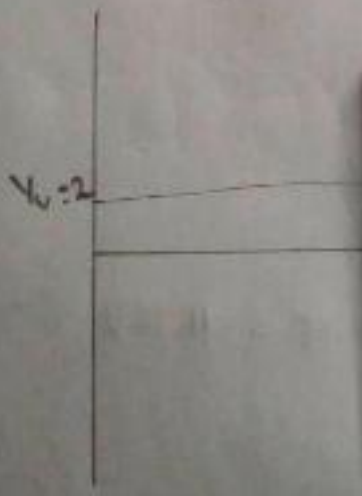
$$\frac{28 - V_v}{I_v} < R < \frac{V - V_p}{I_p}$$

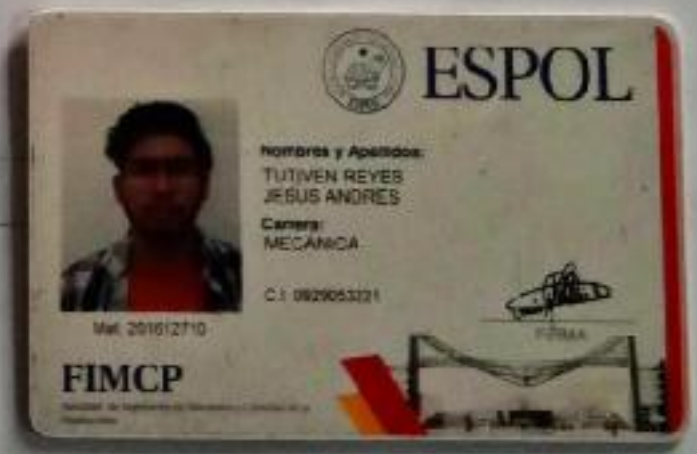
$$\frac{28 - 2V}{3\times10^{-3}} < R < \frac{28 - 1.18}{5\times10^{-6}}$$

$8.67K < R < 5.36\times10^3 K$

$R = 100K\Omega$

+25p

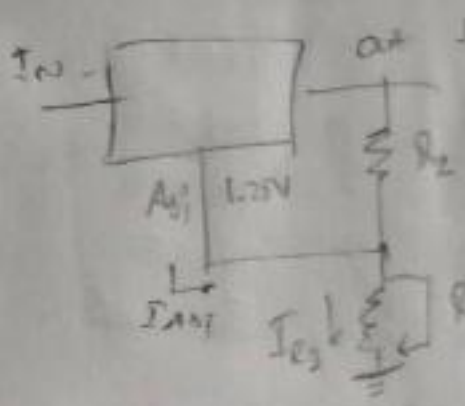




3)

$R_3 = 330$

$R_5 = 11.3\,k\Omega$



$V_{out} = V_{R2} + V_{R3}$

$V_{R2} = 1.25$

$V_{R3} =$

✓ +4p

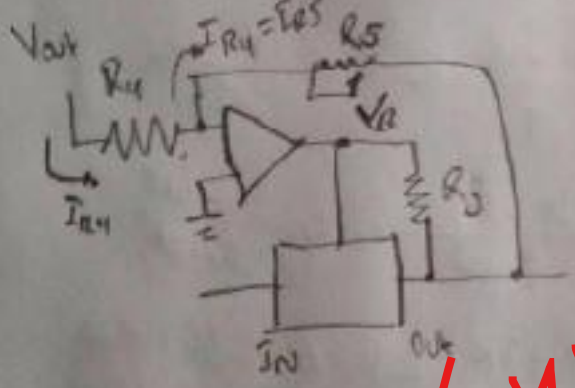
- $I_{R3} = 10.47\,mA$
- $V_{R3} = 3.96V$
- $V_{out} = 5.21V$
- $I_{R4} = 1.1mA$
- $I_{R5} = 1.1\,mA$
- $V^- = -12.53V$
- $V_B = -11.28V$

$I_{R3} = I_{R2} + I_{Adj}$

$I_{R3} = \frac{V_{R2}}{R_2} + \frac{I_{Adj}}{0}$ ✓ +4p

$I_{R3} = \frac{1.25V}{120\Omega} = 0.01042\,A = 10.42\,mA$ ✓ +4p

$V_{R3} = I_{R3} R_3 = 0.0$ ✓ +4p $= 3.96V$



$I_{R4} = \frac{V_{out}}{R_4} = \frac{5.21}{4.7k\Omega} = 1.1mA$ ✓ +4p

$I_{R5} = I_{R4} = 1.1mA$ ✓ +4p

$V^- = -V_{out}\left(\frac{R_5}{R_4}\right) = \frac{11.3k}{4.7k}(-5.21) = -12.53V$ ✓ +4p

$V_B = V^- + V_{Adj} = -12.53 + 1.25 = -11.28V$ ✓ +4p

Examen Electrónica II Parcial

Nombre: Jefferson Iván Vega Sarango Paralelo: 2 Fecha: 25/01/2022

99/100

Compromiso de Honor

Reconozco que el presente examen está diseñado para ser resuelto de manera individual y no se permite la ayuda de fuentes no autorizadas ni copiar. Firmo al pie del presente compromiso, como constancia de haber leído y acepto la declaración anterior.

(firma)

Tema (1)

Reducir la expresión lógica usando Álgebra de Boole:

$$\bar{A}\bar{B}C\bar{D}\bar{E} + \bar{A}BC\bar{D}E + ABC\bar{E} + ABC\bar{D}E + E$$

a) Expresión lógica reducida.

b) Implementar la expresión reducida usando únicamente compuertas OR, AND y NOT.

$\rightarrow \bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + ABC\bar{E} + ABC\bar{D}E + E$ (E)

$\rightarrow \bar{A}\bar{B}C\bar{E} + \bar{A}BC\bar{D}E + A\bar{B}C\bar{D}\bar{E} + E$ (E)

$\rightarrow \bar{A}\bar{B}C\bar{E} + A\bar{B}C\bar{E} + E$

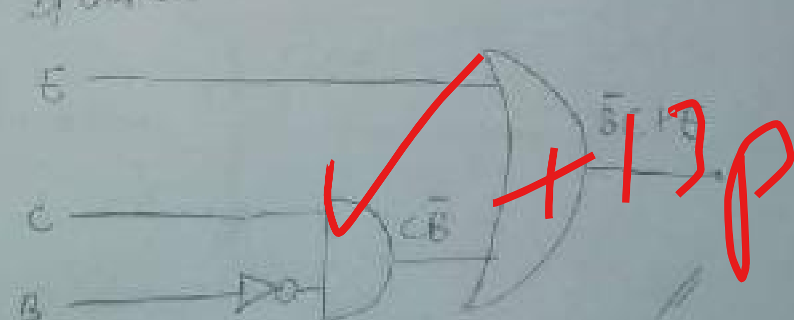
$\rightarrow (\bar{A} + A) \cdot \bar{B}C\bar{E} + E$

$\rightarrow \bar{B}C\bar{E} + E$

$\rightarrow \bar{B}C + E$ //

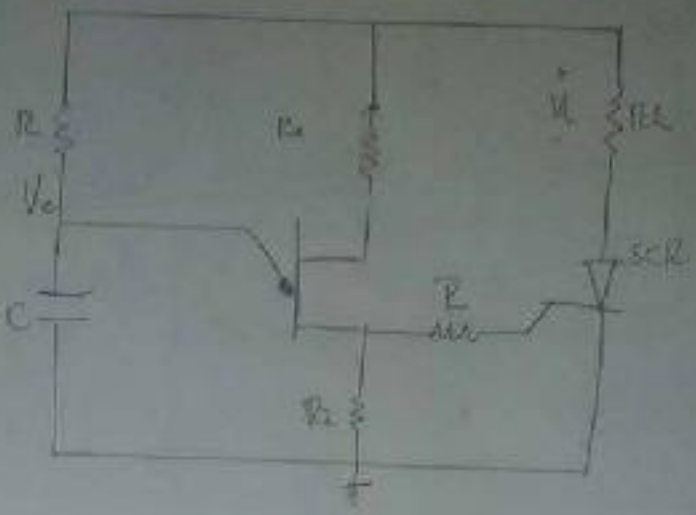
✓ +20p

b) Gráfica



Tema ②

a) Determinar los valores de R_1 y C para un retardo de 10 ms.



$V_{cc} = 28V$

$R_{b1}^{(sat)} = \alpha R_{bb} = 4.2\,K\Omega$

$R_{b2} = R_{bb} - R_{b1(sat)} = 1.8\,K\Omega$

$V_e = V_{cc}\dfrac{R_{b1(sat)}}{R_1 + R_{bb} + R_{b2}} = 19.35\,V$

$V_p = V_D + V_e = 19.85\,V$

$\rightarrow t_c = 10\,ms$

Para la carga

$t_c = RC\ln\left(\dfrac{V_{cc} - V_{ic}}{V_{cc} - V_{fc}}\right)$

$t_c = RC\ln\left(\dfrac{28}{28 - V_p}\right)$

$C = \dfrac{t_c}{R\ln\left\{\dfrac{28}{28 - 19.35}\right\}}$

Si $R = 1K\Omega$

$\rightarrow C = 0.81\,\mu F$ //

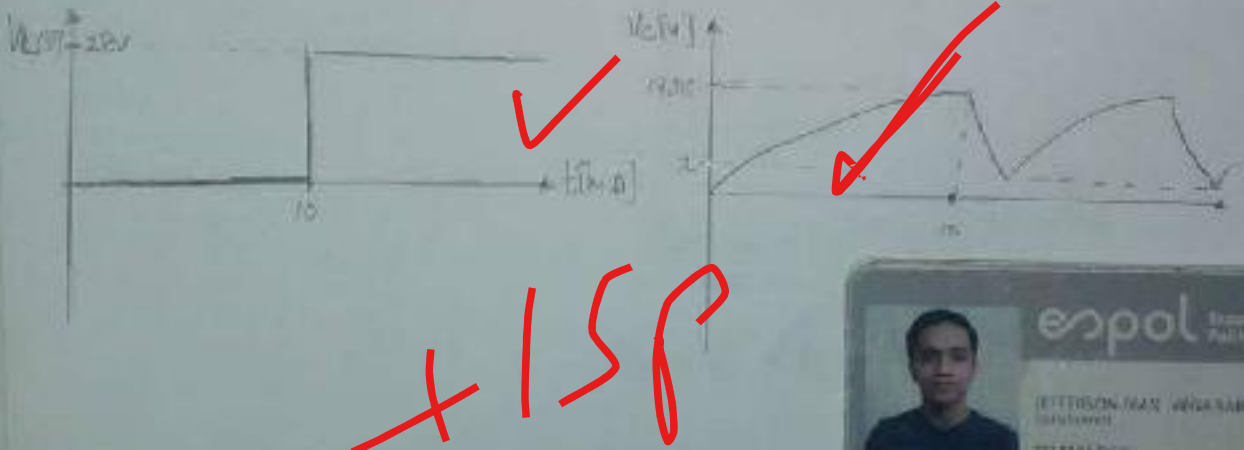
$\rightarrow I_p < I_R < I_V$

$5\mu A < \dfrac{V_{cc} - V_c}{R} < 3mA$

$R > \dfrac{28 - V_V}{3mA} \Rightarrow R > 9.3K\Omega$ //

$R < \dfrac{28 - V_p}{5\mu A} \Rightarrow R < 1.63M\Omega$ //

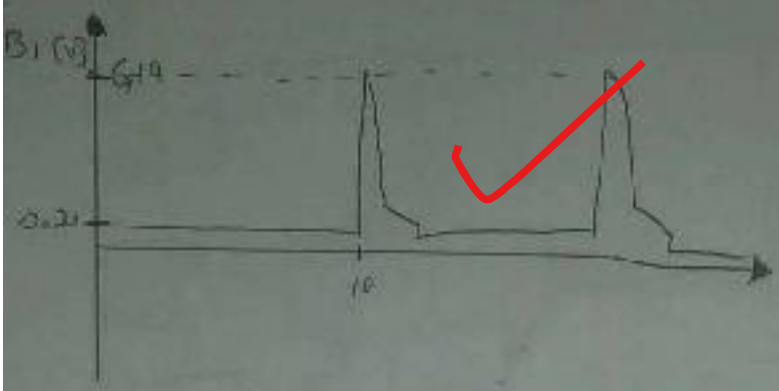
b) Graficar



+2 p

+1 p

+1 p



$$V_{B_1(OFF)} = 28 \cdot \frac{R_2}{R_1 + R_2 + R_{bb}}$$

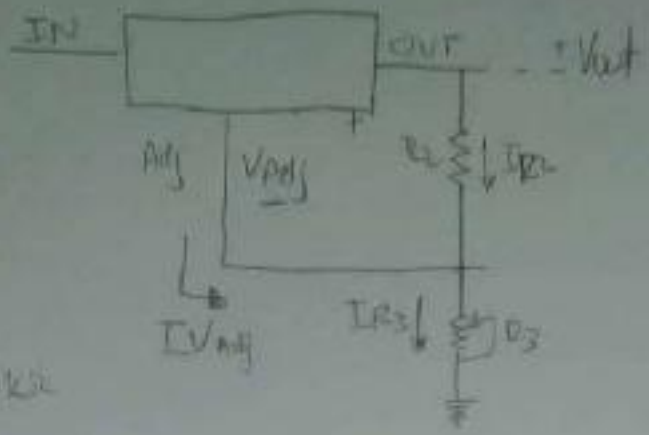
$$\boxed{V_{B_1(OFF)} = 0.21\ V}$$

$$V_{B_1(ON)} = V_E \cdot \frac{R_2}{R_{b_1(ON)} + R_2}$$

$$\boxed{V_{B_1(ON)} = 0.19\ V}$$

Tema (3)

Dado el circuito, calcular:



$R_3 = 280K\Omega$

$R_2 = 12.3K\Omega$

$V_{ADJ} = 1.25\,V$

$I_{ADJ} \approx 0A$

$I_{R3} = I_{R2} + I_{ADJ}$

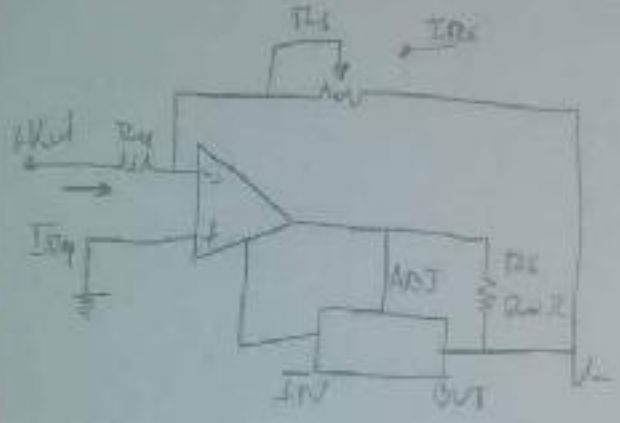
$I_{R3} = I_{R2} = \frac{V_{ADJ}}{R_2} = \frac{1.25\,V}{120\,\Omega}$

$I_{R3} = 10.42\,mA$ //

$V_{R3} = I_{R3} R_3 = (10.42\,mA)(0.28K\Omega)$

$V_{R3} = 3.16\,V$ //

$+V_{out} = V_{ADJ} + V_{R3}$ //



$V_{OUT} = -10\,V$ //

$I_{Rsig} = \frac{V_{out} - V_{ADJ}}{R_{sig}} = \frac{5.21\,V}{11.7K\Omega} = 1.11\,mA$ //

$I_{RS} = I_{R1}$ //

$V^- = -V_{out}\frac{R_S}{R_1} = (-5.21)\left(\frac{11.7K\Omega}{5K\Omega}\right) = -12.53\,V$

$V^- = -12.53\,V$ //

$V_{ADJ} = -1.25\,V = V^- - V_B$

$V_0 = V^- + 1.25 = -11.22\,V$ //

+4P +4P +4P +4P +3P +4P +4P

Jose Jhoan Zapata Becerra

P 02

Examen Parcial 2

58/100

Reconozco que el presente debe ser desarrollado para ser resuelto de manera individual, y no se permite la ayuda de fuentes no autorizadas ni copias. Firmo al pie del presente compromiso, como constancia de haber leído y aceptado la declaración anterior.

1)

$$\bar{A}B\underset{1}{C\bar{E}} + \bar{A}\underset{2}{BC\bar{D}E} + A\underset{1}{\bar{B}C\bar{E}} + ABC\underset{2}{\bar{D}E} + E$$

a) $(\bar{A}+A)\cdot\bar{B}C\bar{E} + (\bar{A}+A)\cdot BC\bar{D}E + E$ b)

$\bar{B}C\bar{E} + BC\bar{D}E + E$

$\bar{B}C\bar{E} + E + BC\bar{D}E$

$\bar{B}C + E + BC\bar{D}E$

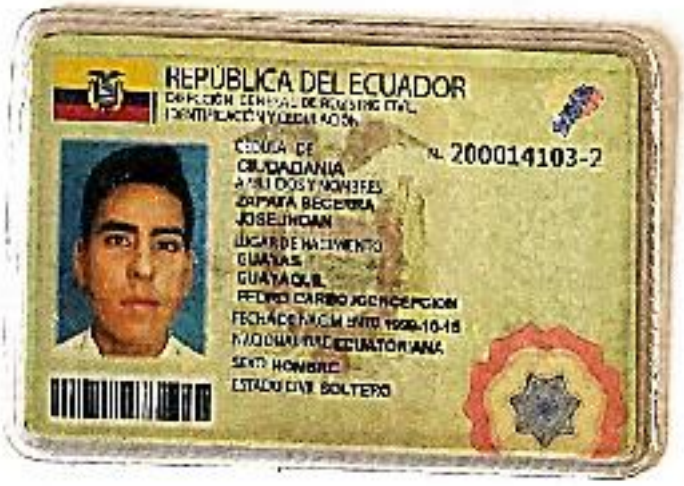
$\bar{B}C + E(1 + BC\bar{D})$

$\bar{B}C + E$

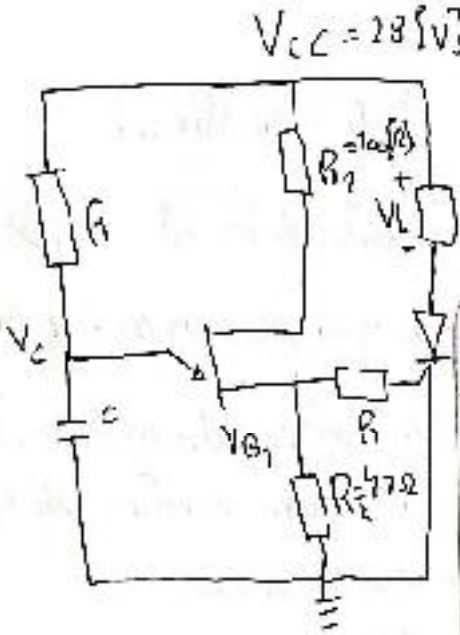
+3p

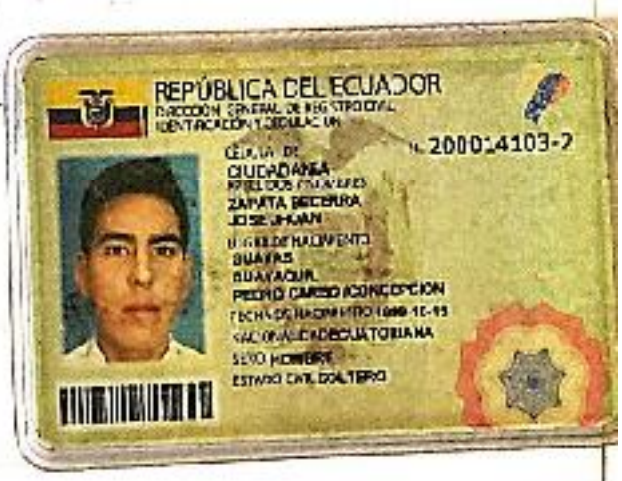
+2p

+2p

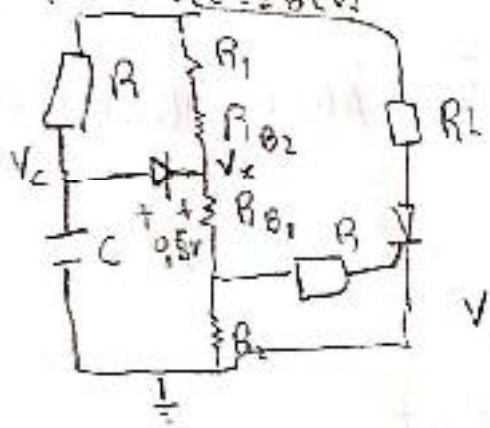


2)





a) $R = ?$ $C = ?$, retardo de 1 ms



$R_{BB} = 6\,K$

$h = 0,7$

$R_{B_1} \cong 100$

$$R \geq \frac{V - V_v}{I_v}$$

$$R \geq \frac{V - V_v}{I_v}$$

$$\therefore \frac{V_{cc} - V_v}{I_v} < R_L < \frac{V_{cc} - V_p}{I_p}$$

$$\frac{28 - 2}{3[m]} < R_L < \frac{28 - 20,1}{5[m]}$$

$$3,66 \cdot 10^3 < R < 1,6 \cdot 10^{-6}$$

$V_p = 0,5 + \eta \cdot V_{CC}$

$V_p = 20,1[V]$

$T_1 = R \cdot C \cdot \ln\left(\frac{V_{CC} - V_v}{V_{CC} - V_p}\right)$

$10[ms] = 10 \cdot 10^3 \cdot C \cdot \ln\left(\frac{26}{7,9}\right)$

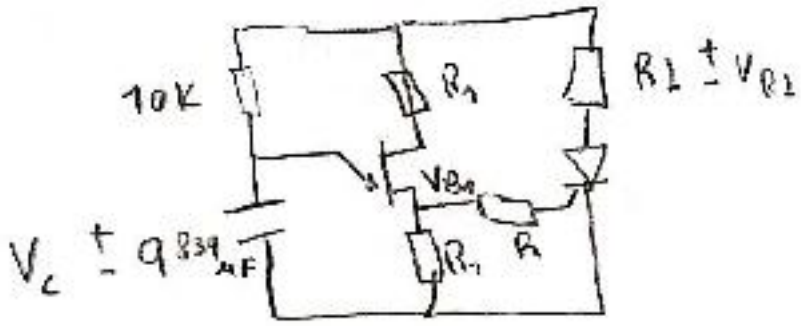
$1 \cdot 10^{-6} = C \cdot 1,1912$

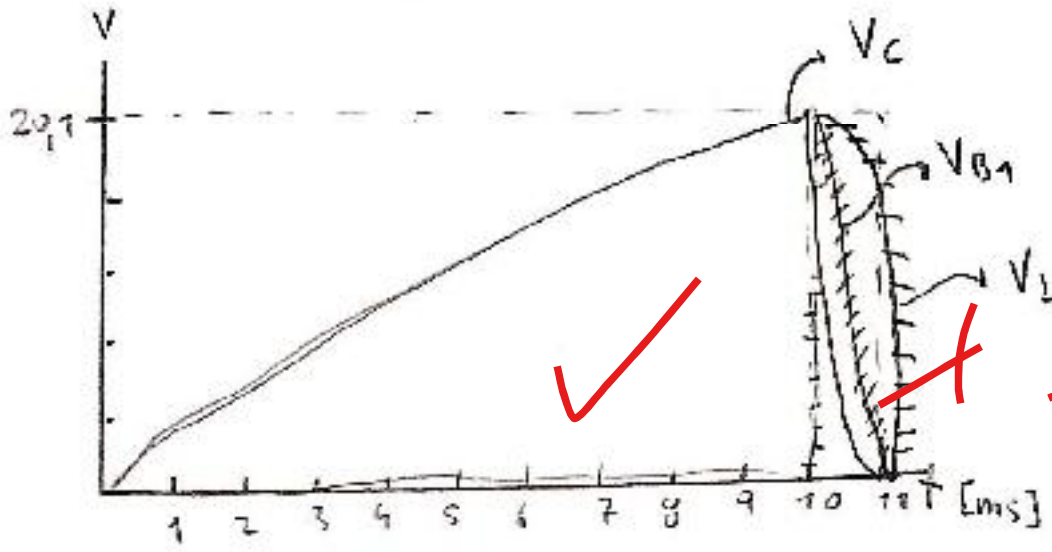
$C = 0,839[\mu F]$ //

∴ la resistencia puede estar entre que resolver para asegurar el disparo. asumiendo una resistencia de

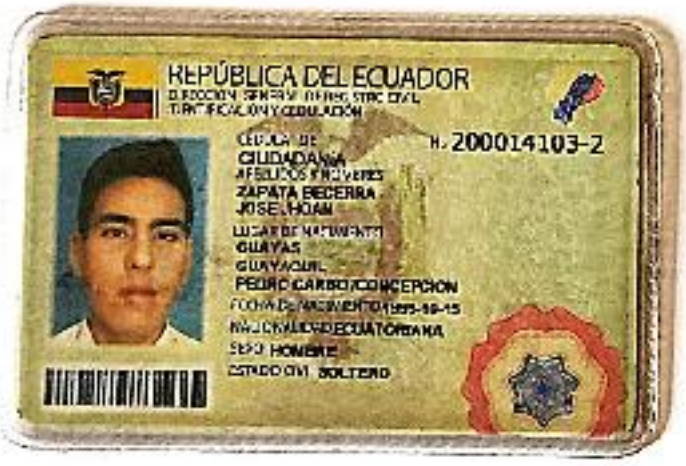
$R = 10\,K\,\Omega$ //

b)


10K
R_1
R_L ± V_{RL}
V_{BB}
V_C ± 9,839 µF
R_1
R


V
V_C
V_{B1}
V_L
T [ms]
1 2 3 4 5 6 7 8 9 10 11

+5p


REPÚBLICA DEL ECUADOR
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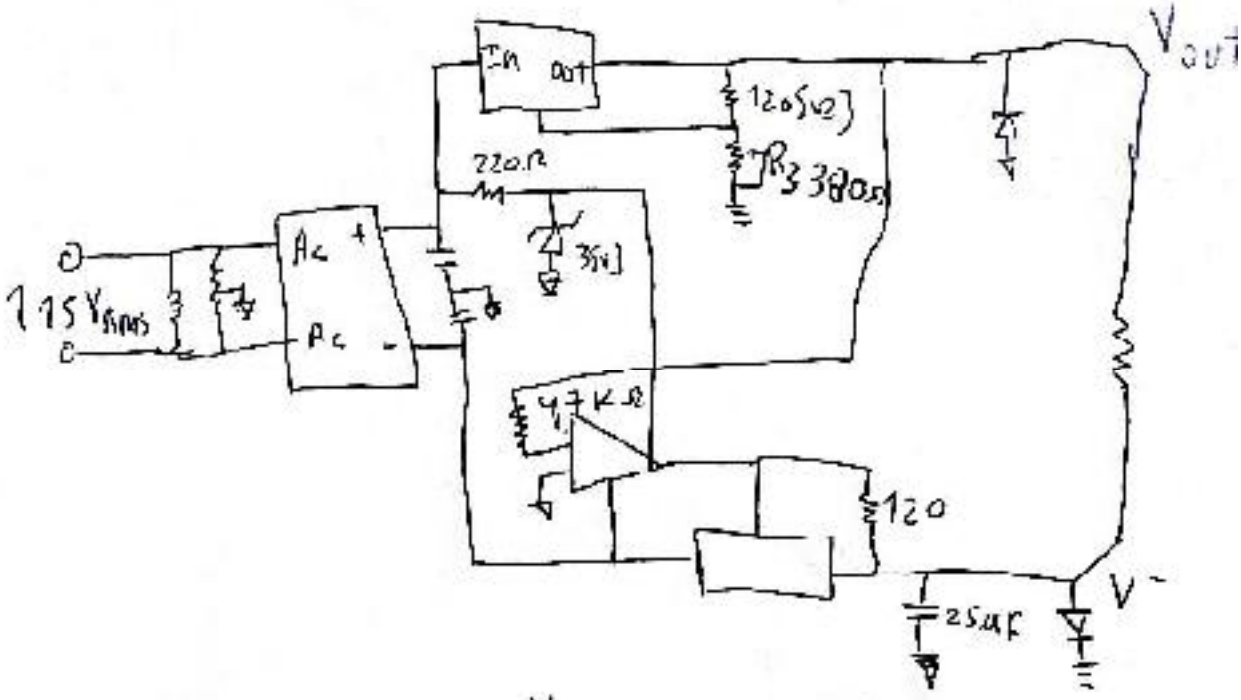
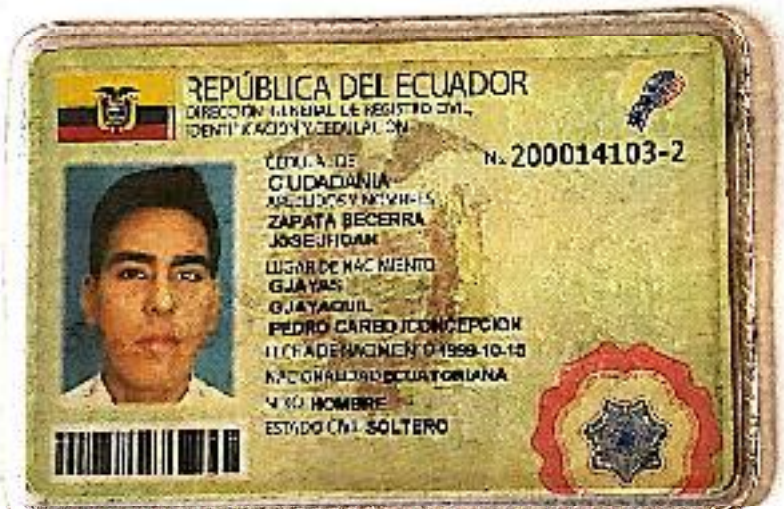
JOSE JHOAN
GUAYAS
GUAYAQUIL
PEDRO CARBO/CONCEPCION
NACIONALIDAD ECUATORIANA
SEXO HOMBRE
ESTADO CIVIL SOLTERO

3)


IN
OUT
120[Ω]
220Ω
3[V]
115 V rms
AC +
AC -
47 KΩ
120
25uF
V-
Vout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