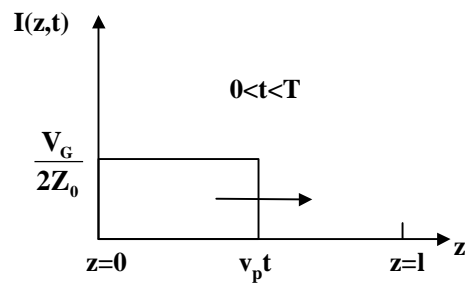
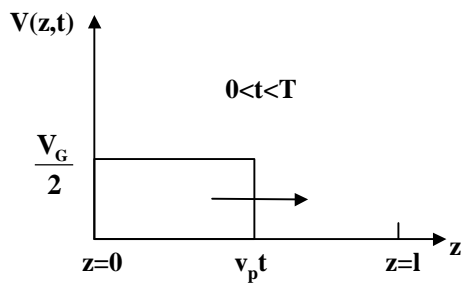
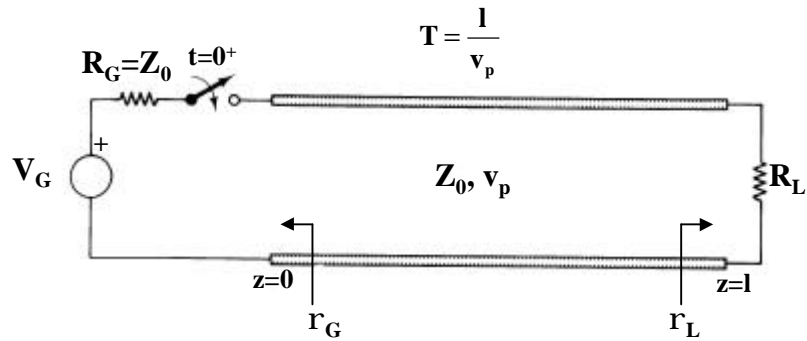
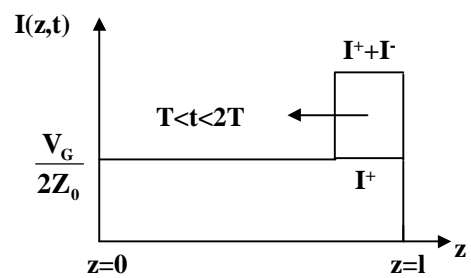
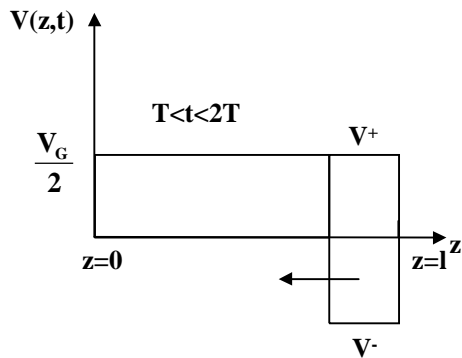


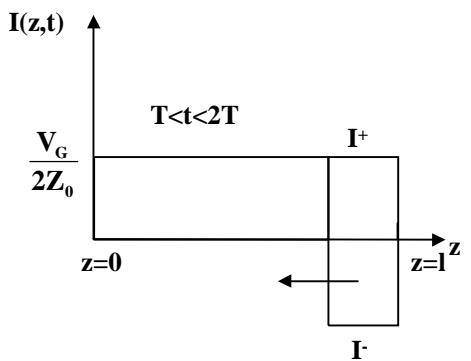
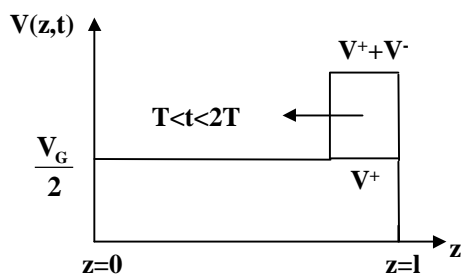
TRANSISTORIS EN LÍNIES DE TRANSMISSIÓ IDEALS RESPOSTA A L'ESGLAÓ DE TENSIÓ



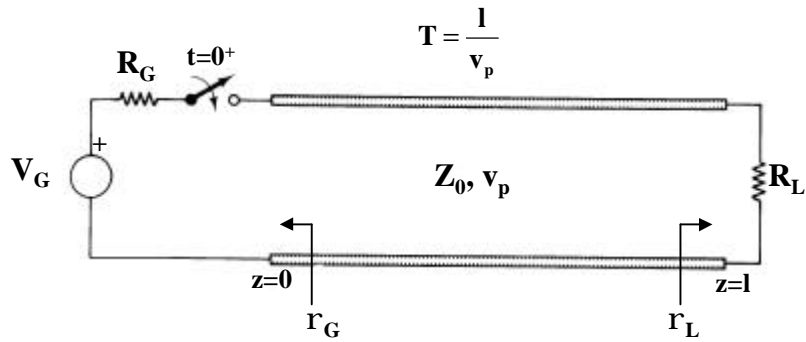
$R_L = 0$ (C.C.)



$R_L = \infty$ (C.O.)



RÈGIM PERMANENT



$$V^+ = V_G \frac{Z_0}{Z_0 + R_G}$$

$$r_L = \frac{R_L - Z_0}{R_L + Z_0}$$

$$r_G = \frac{R_G - Z_0}{R_G + Z_0}$$

$$V_{t \rightarrow \infty} = V^+ + V^+ r_L + V^+ r_L r_G + V^+ r_L^2 r_G + \dots = V^+ \left[\sum_{i=0}^{\infty} r_L^i r_G^i + \sum_{i=1}^{\infty} r_L^i r_G^{i-1} \right]$$

$$V_{t \rightarrow \infty} = V_G \frac{R_L}{R_L + R_G}$$

$$I_{t \rightarrow \infty} = \frac{V_G}{R_L + R_G}$$

DIAGRAMES ESPAI-TEMPS DE TENSIÓ I DE CORRENT

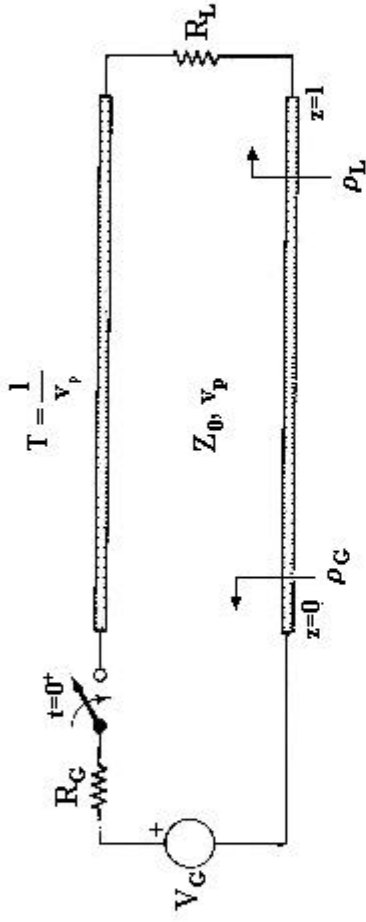


DIAGRAMA DE TENSIÓ

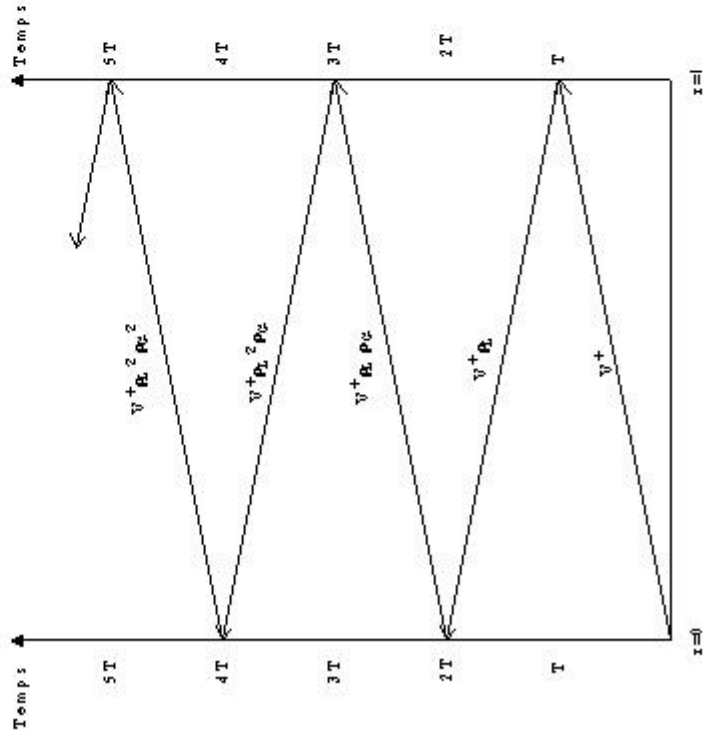


DIAGRAMA DE CORRENT

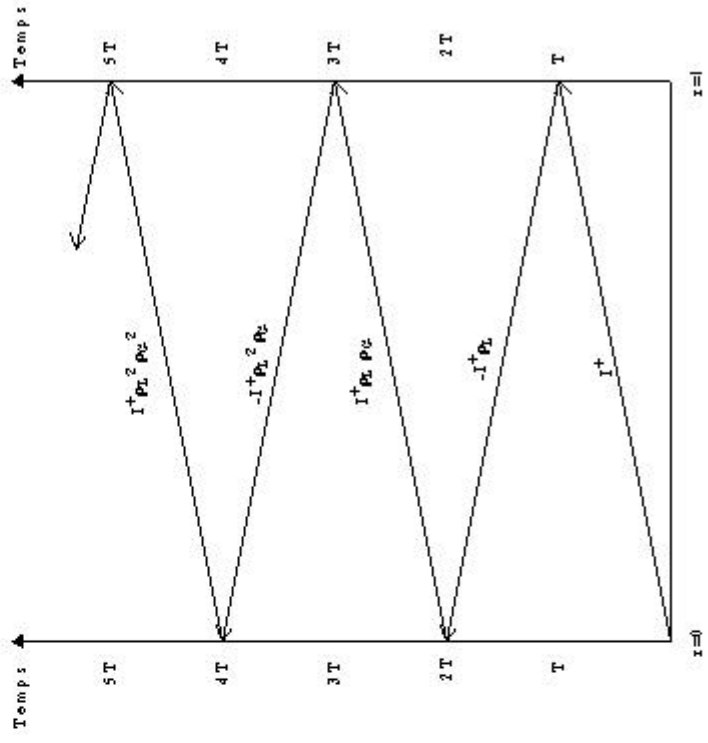
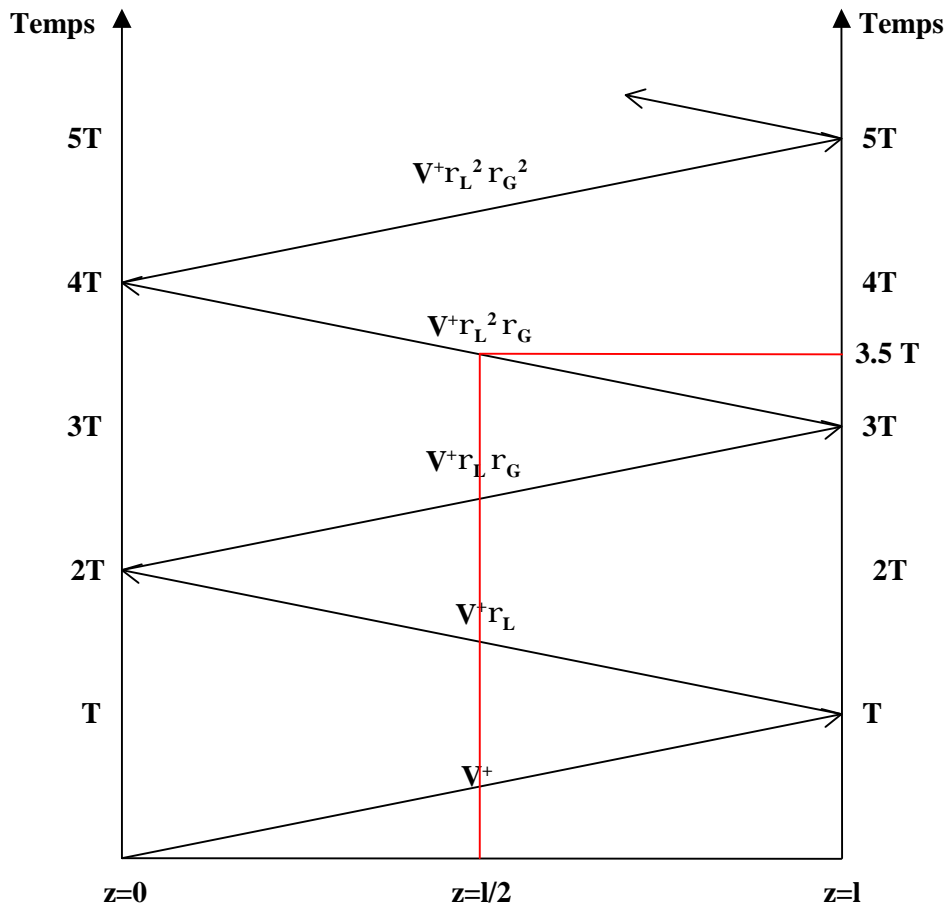


DIAGRAMA DE TENSIONS



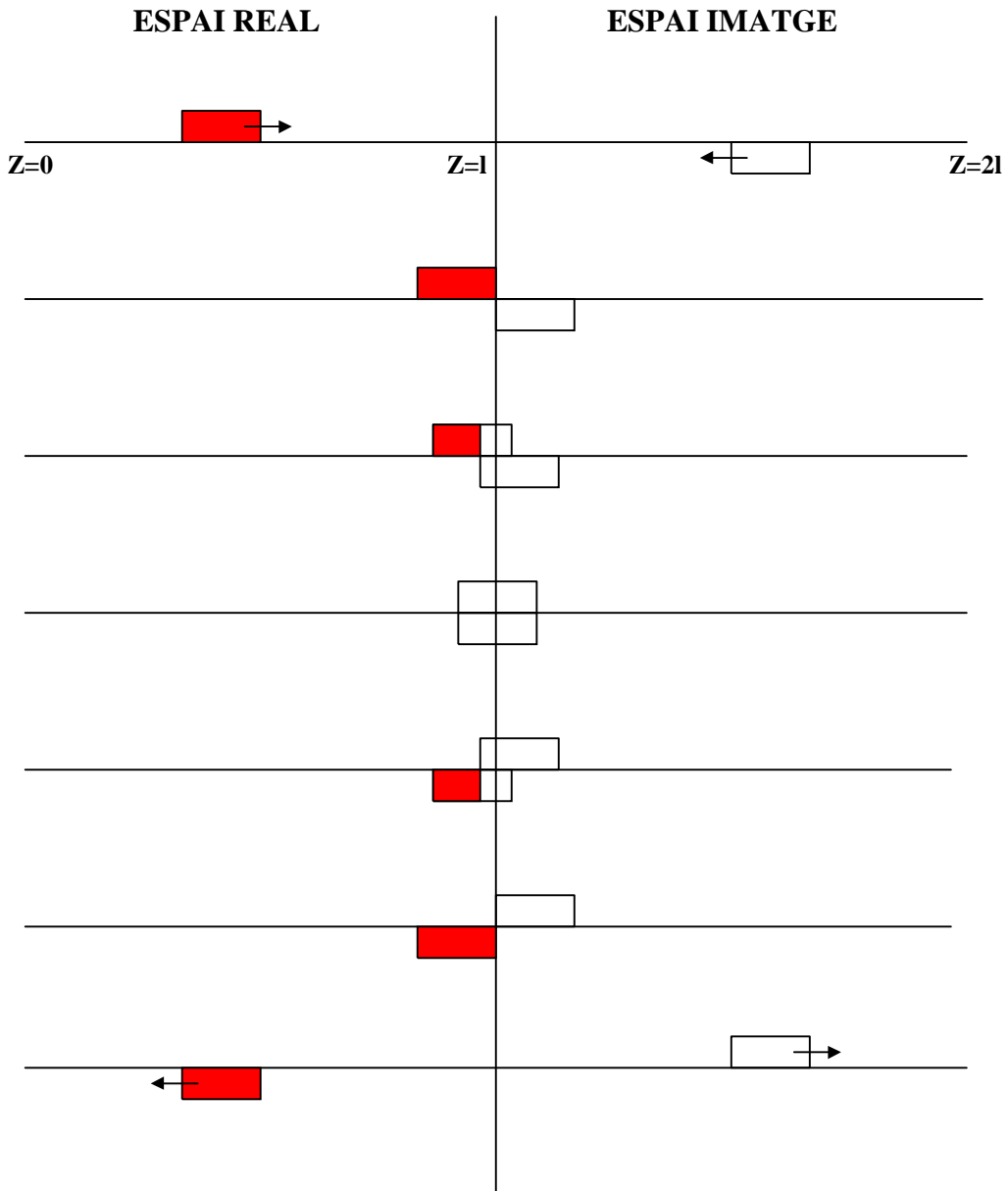
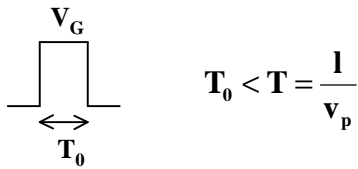
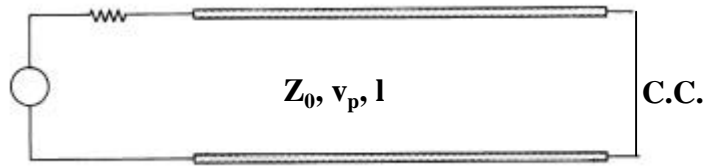
$$V(z=l/2, t=3.5T) = V^+ + V^+ r_L + V^+ r_L r_G + V^+ r_L^2 r_G$$

$$V(z > l/2, t=3.5T) = V(z=l/2, t=3.5T)$$

$$V(z < l/2, t=3.5T) = V^+ + V^+ r_L + V^+ r_L r_G$$

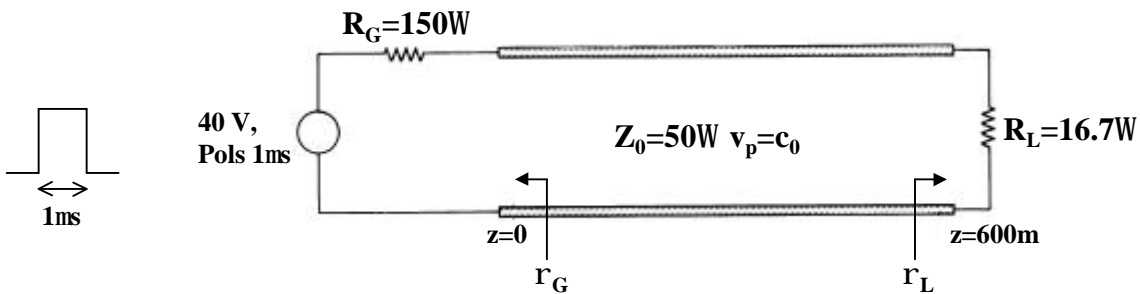
$$V(z=0, t=4T) = V^+ + V^+ r_L + V^+ r_L r_G + V^+ r_L^2 r_G + V^+ r_L^2 r_G^2$$

PROPAGACIÓ DE POLSOS EN UNA LÍNIA DE TRANSMISSIÓ

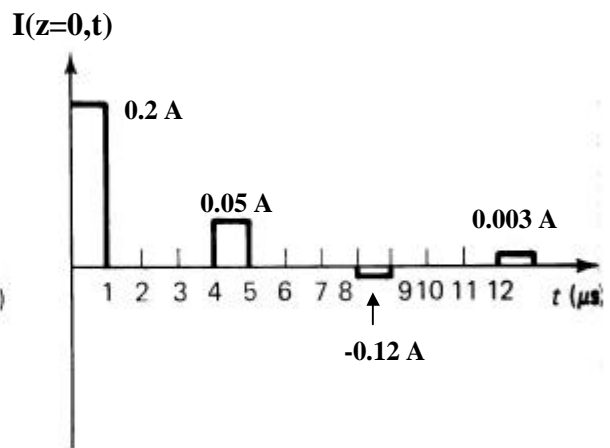
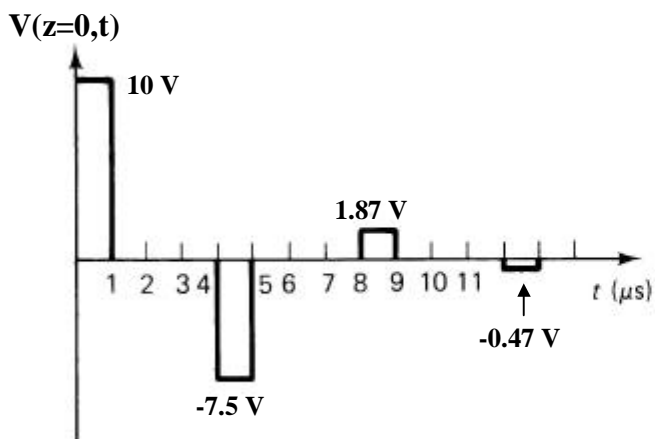
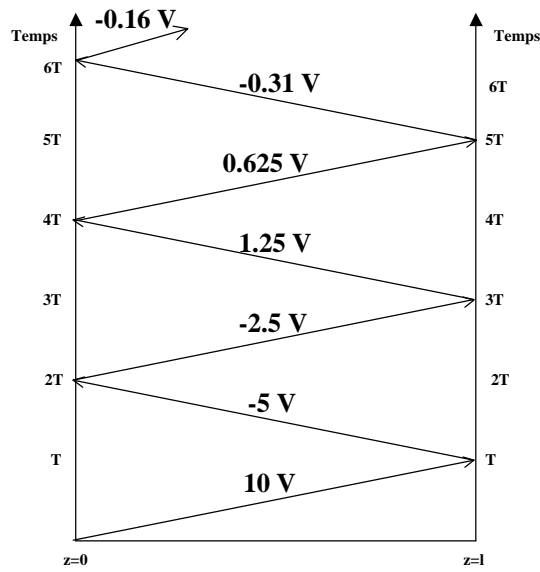


EXEMPLE SOBRE PROPAGACIÓ DE POLSOS

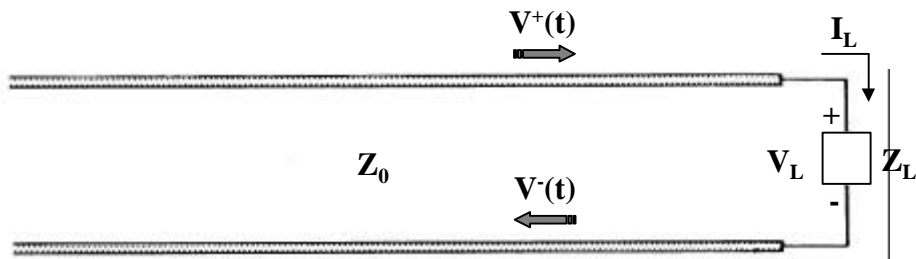
V(z=0), I(z=0) ?



$$V^+ = V_G \frac{Z_0}{Z_0 + R_G} = 10 \text{ V} \quad r_L = \frac{R_L - Z_0}{R_L + Z_0} = -0.5 \quad r_G = \frac{R_G - Z_0}{R_G + Z_0} = 0.5 \quad T = \frac{l}{v_p} = 2 \text{ ns}$$



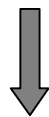
REFLEXIÓ SOBRE CÀRREGUES REACTIVES DE PRIMER ORDRE



LA TENSIÓ I EL CORRENT A LA CÀRREGA:

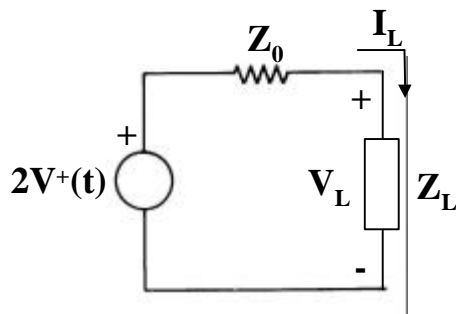
$$V_L(t) = V^+(t) + V^-(t)$$

$$I_L(t) = I^+(t) + I^-(t) = \frac{1}{Z_0} (V^+(t) - V^-(t))$$



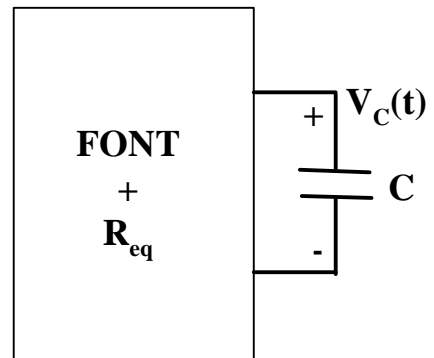
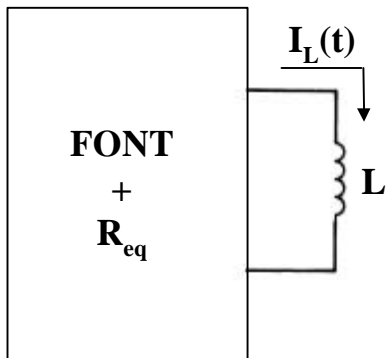
CIRCUIT EQUIVALENT

$$2V^+(t) = V_L(t) + Z_0 I_L(t)$$



$$2V^+(t) \longrightarrow V_L(t), I_L(t), V^-(t)$$

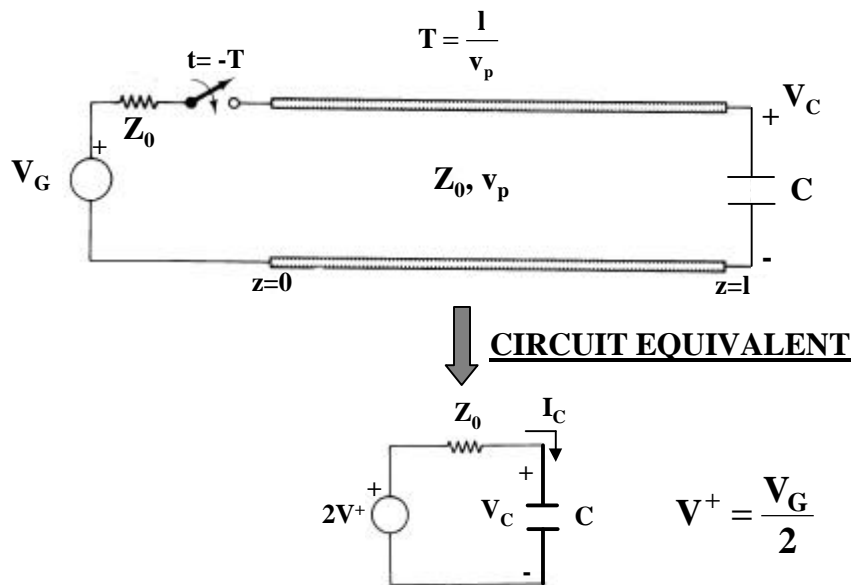
RESOLUCIÓ DE CIRCUITS DE PRIMER ORDRE



$$I_L(t) = I_f - (I_f - I_i)e^{-t/\tau} \quad \tau = \frac{L}{R_{eq}}$$

$$V_C(t) = V_f - (V_f - V_i)e^{-t/\tau} \quad \tau = R_{eq}C$$

EXEMPLE: CONDENSADOR DESCARREGAT CONECTAT A UNA L.T.



COMPORTAMENT CONDENSADOR:

Estat inicial: C.C. $\Rightarrow V_{Li}=0$
 Estat final: C.O. $\Rightarrow V_{Lf}=2V^+=V_G$

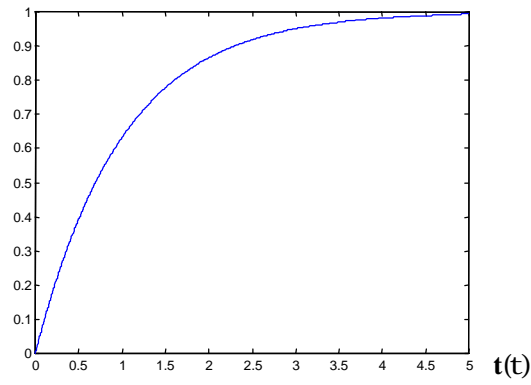
SOLUCIÓ:

$$V_L(t) = V_G(1 - e^{-t/\tau}) \quad \tau = Z_0 C$$

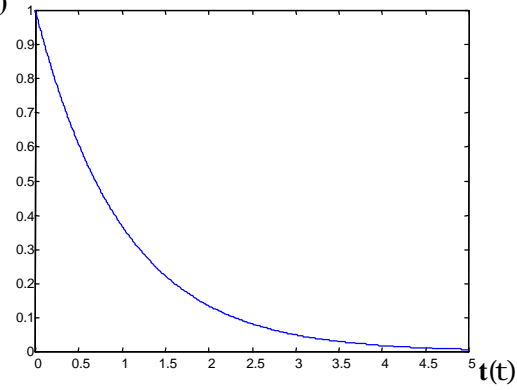
$$I_L(t) = C \frac{dV_L}{dt} = \frac{V_G}{Z_0} e^{-t/\tau}$$

$$V^-(t) = \frac{V_G}{2} (1 - 2e^{-t/\tau})$$

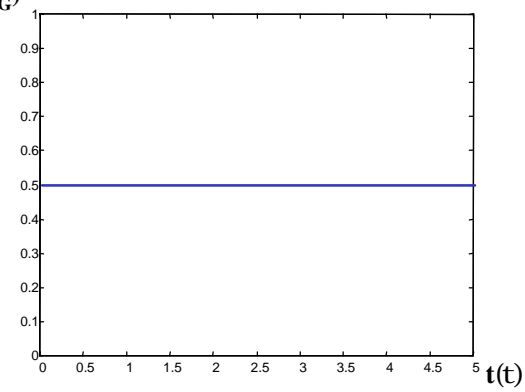
$V_L(V_G)$



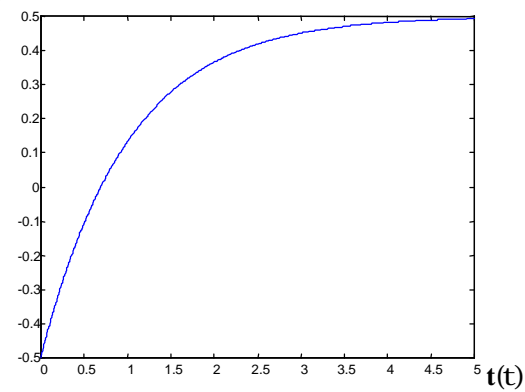
$I_L(V_G/Z_0)$



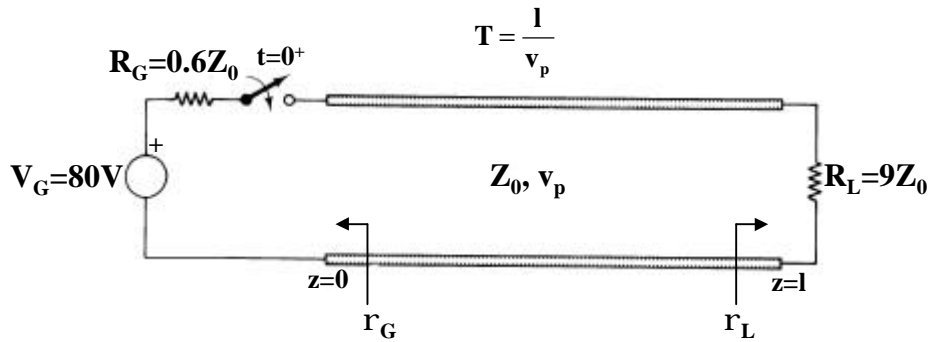
$V^+(V_G)$



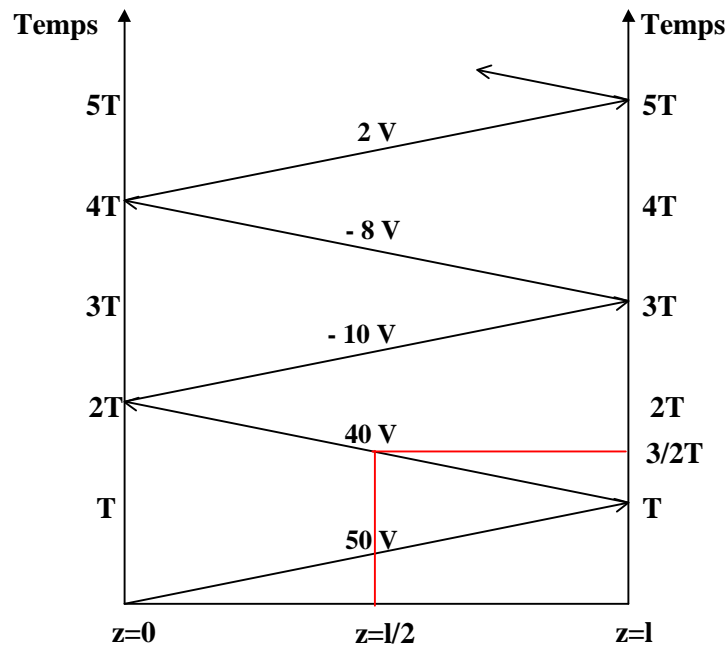
$V^-(V_G)$



PROBLEMA 2

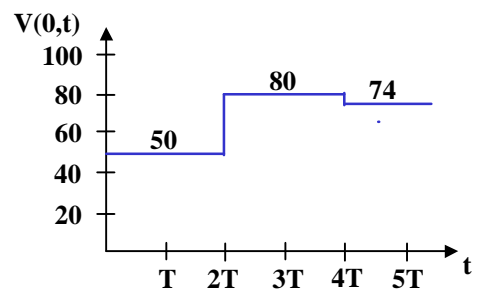
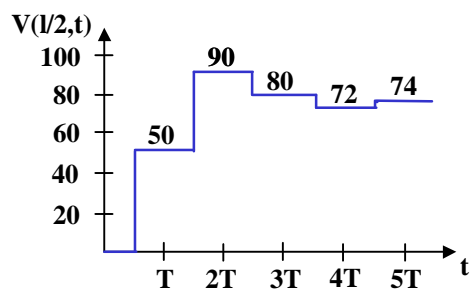


a)

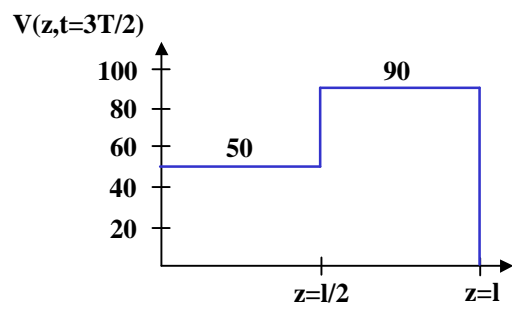


$$V^+ = V_G \frac{Z_0}{Z_0 + R_G} = 50V \quad r_L = \frac{R_L - Z_0}{R_L + Z_0} = 0.8 \quad r_G = \frac{R_G - Z_0}{R_G + Z_0} = -0.25$$

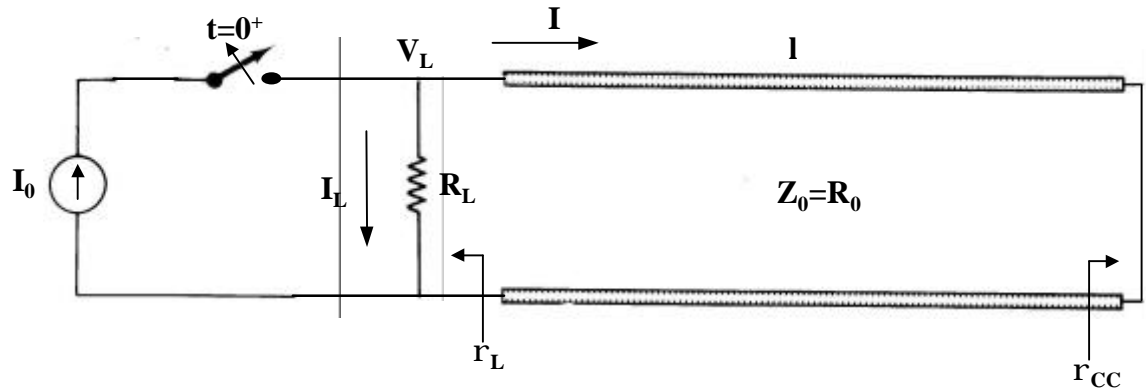
b)



c)



PROBLEMA 6



CONDICIONS INICIALS : ($t < 0^+$)

$$V_i = V(0, t) = 0$$

$$I_i = I(0, t) = I_0$$

AL COMMUTAR $t=0^+$:

$$V(0, 0^+) = V^+ + V_i = V^+$$

$$I(0, 0^+) = I^+ + I_i = V^+ / Z_0 + I_0$$

$$V_L = I_L R_L$$

$$V_L = V(0, 0^+)$$

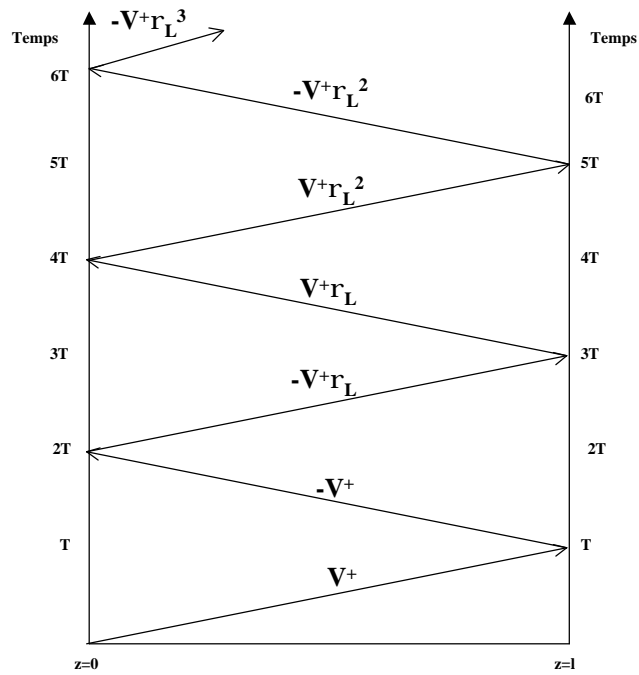
$$I_L = -I(0, 0^+)$$

SUBSTITUINT:

$$V^+ = -R_L (I_0 + V^+ / Z_0)$$



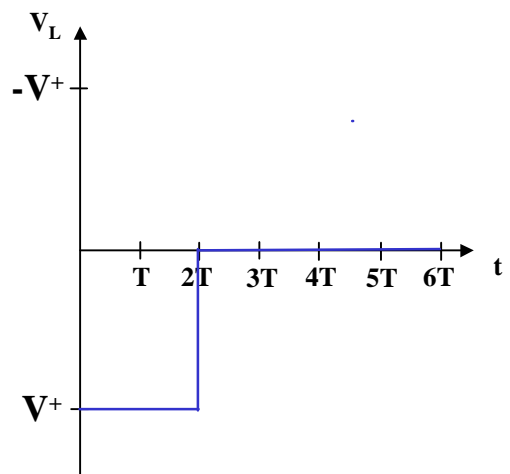
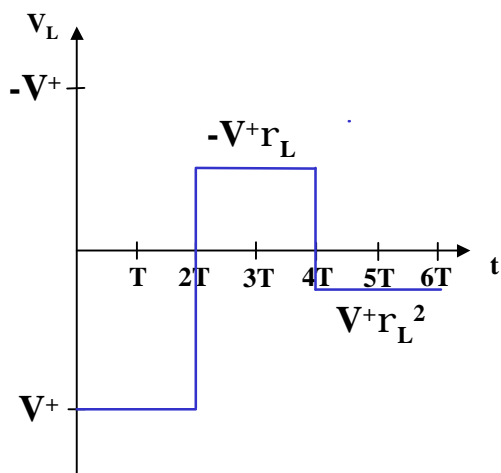
$$V^+ = -\frac{R_L Z_0}{R_L + Z_0} I_0$$



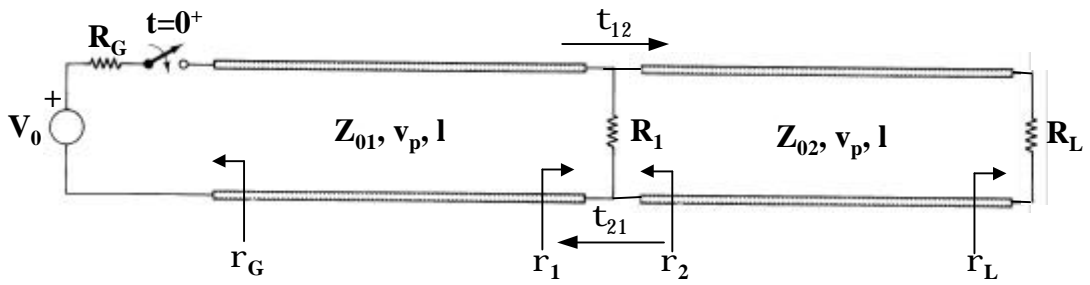
$V^+ = -\frac{R_L R_0}{R_L + R_0} I_0$	$r_L = \frac{R_L - R_0}{R_L + R_0}$	$r_{CC} = -1$
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a) $R_L > Z_0, r_L > 0$

b) $R_L = Z_0, r_L = 0$



PROBLEMA 9



$R_1=150W, R_L=16.67W, R_G=75W, Z_{01}=75W, Z_{02}=50W$

