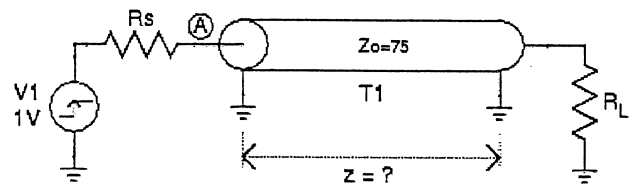
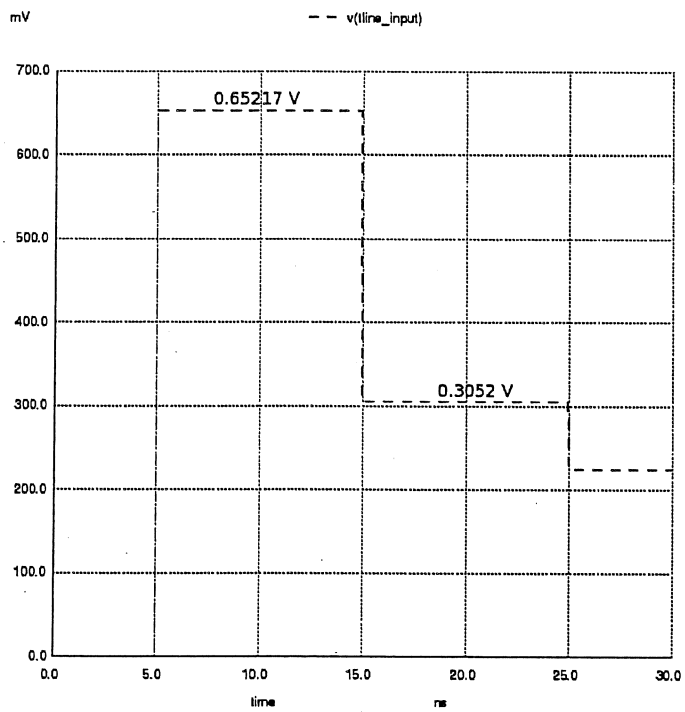
9. Consider the circuit and spice waveform for point "A" below. The generator launches the rising edge at 5ns. Find:

(a) The length z of the coax cable. $z =$ 5ns

(b) $R_S =$ 40 Ω

(c) $R_L =$ 10 Ω





R_S: $V_{inc} = 1 \cdot \frac{75}{75+R_S}$

$.65217 = \frac{75}{75+R_S}$

$.65217(R_S+75) = 75$

$.65217R_S + 48.91 = 75$

$R_S = 40\Omega$

R_L: $.3052 = 0.65217 + V_1^- + V_2^+$; V_2^+ is $V_1^- \cdot \rho_S \Rightarrow \rho_S = \frac{40-75}{40+75} = -0.3043$

$.3052 = 0.65217 + V_1^-(1+\rho_S)$

$.3052 = 0.65217 + V_1^-(1-0.3043)$

$-0.347 = 0.6957 V_1^-$

$V_1^- = -0.4988$ And we know $\rho_L = \frac{V_1^-}{V_1^+}$, so $\rho_L = \frac{-0.4988}{.65217} = -0.7648$

Since ρ_L is also $= \frac{R_L-75}{R_L+75}$; $-0.7648 = \frac{R_L-75}{R_L+75}$

$-0.7648(R_L+75) = R_L-75$

$-0.7648R_L - 57.36 = R_L - 75$

$-1.7648R_L = -75+57 \Rightarrow R_L = 10.2\Omega$