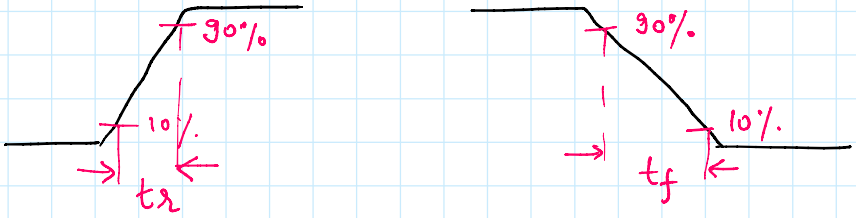
Lec-5

Friday, January 17, 2020 8:43 AM

HW-1 posted online.

Rise time & Fall time



Characteristic Impedance:

$$Z_0 = \sqrt{\frac{R+j\omega L}{G+j\omega C}} \qquad = a+ib \quad a-ib$$

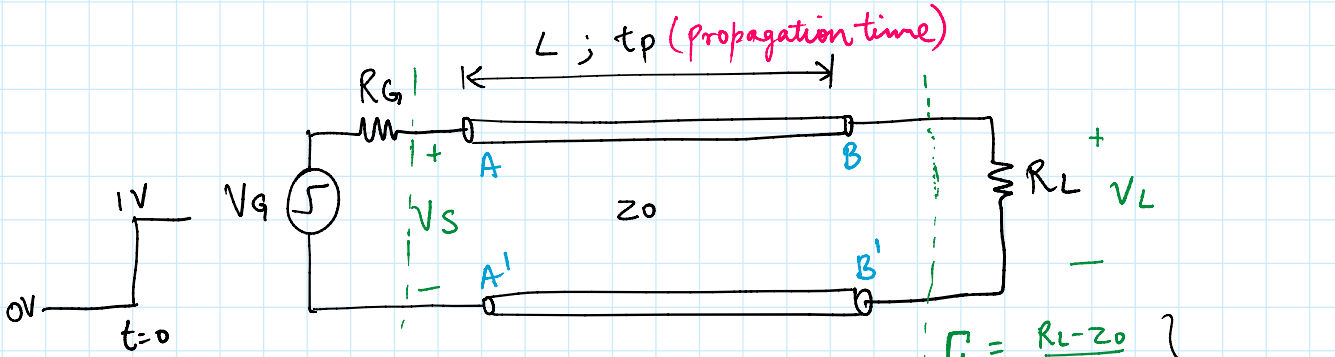
Observations:

1) Z_0 → It is a complex quantity

2) Loss less Transmission line has "real" characteristic impedance

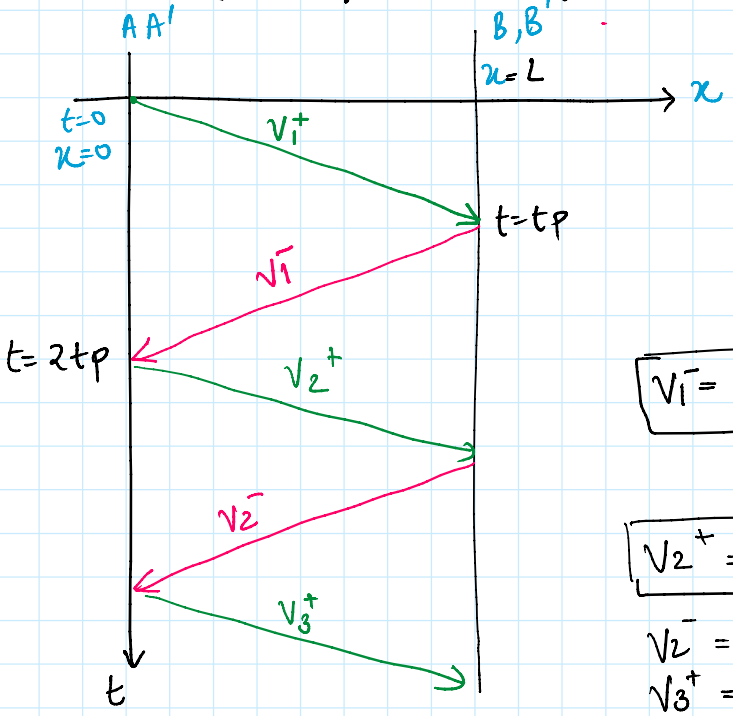
$$R=0 \;;\; G=0 \;;\; Z_0 = \sqrt{\frac{L}{C}} \Big\} \text{ Real}$$

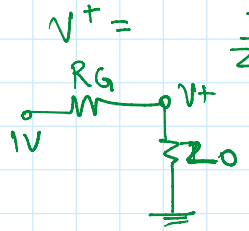
Reflections on a Transmission Line.



$V_S = V_L$ at $t=\infty$

{ Bounce Diagram or Lattice Diagram or Reflection Diagram }





$$V_1^- = \Gamma_L \cdot V_1^+$$

→ Reflection coefficient at the load

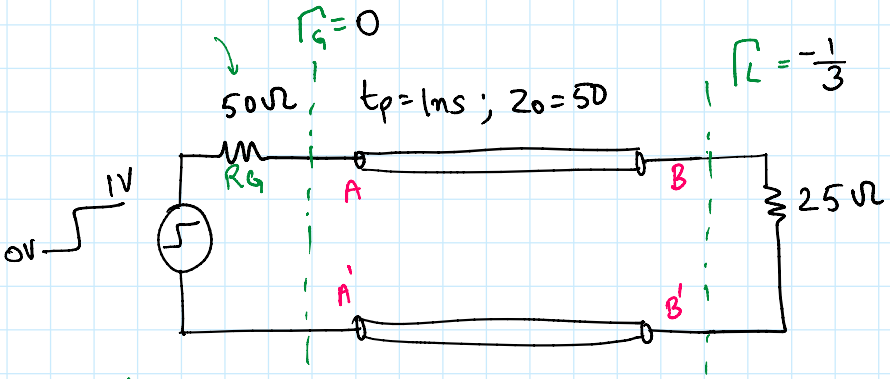
$$V_2^+ = \Gamma_G \cdot V_1^-$$

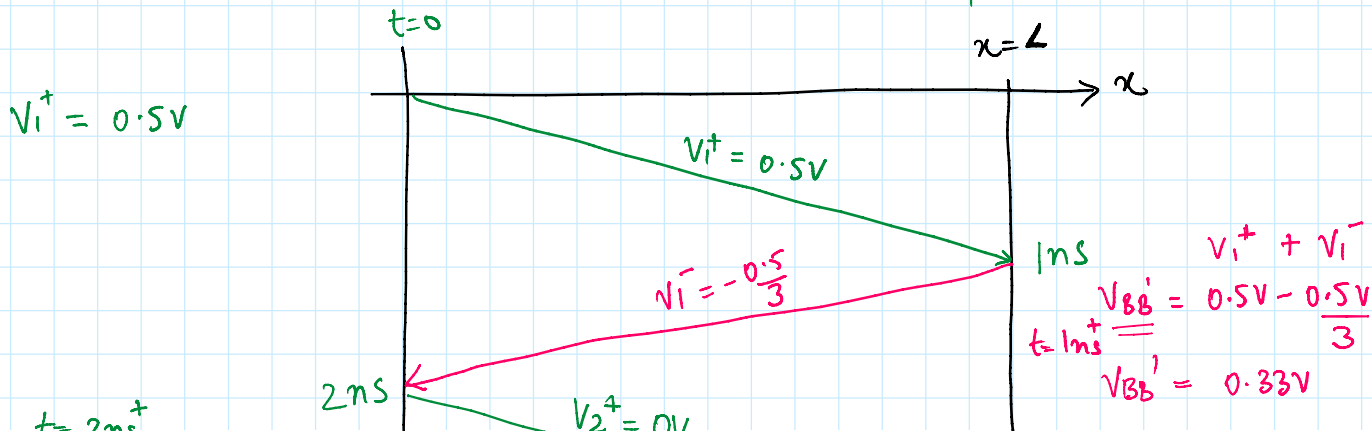
$$V_2^- = \Gamma_L V_2^+$$

$$V_3^+ = \Gamma_G V_2^-$$

At $t = \infty$ the $V_n^+ = 0$, $n \to \infty$

Example 1:

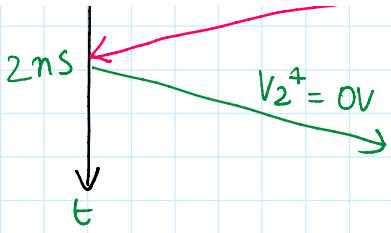




$t = 2ns^{+}$

$V_{AA'} = V_1^{+} + V_1^{-}$

$= 0.33V$



$t = 1ns$

$V_{BB'} = 0.33V$