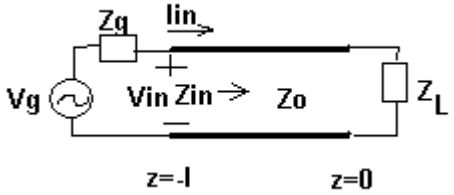
ECE3300 Lossless Transmission Lines



Given: Vg, Zg
The line is a Coax. Given a, b, ε_r, σ, μ , σ_c, μ_c

1. Which Voltage Variable describes: (Not all variables are shown on the picture.)

_____ = Total Voltage at the Input Terminal

_____ = Total Voltage at the Output Terminal

_____ = Total Voltage at the Generator

_____ = Total Voltage anywhere on the line

_____ = Forward-traveling voltage on the line

_____ = Negative-traveling voltage on the line

_____ = Magnitude of the reflected voltage

2. Which Impedance? (Zin, Zo, $Z_{L,}$ other)

____ = Total voltage at the input terminal / Total current at the input terminal

____ = Forward-traveling voltage anywhere / Forward-traveling current anywhere

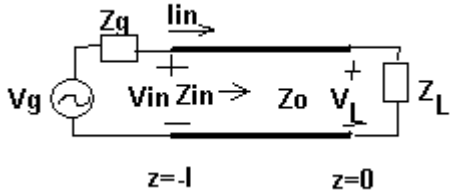
____ = Negative-traveling voltage / Negative-traveling current

____ = Forward-traveling voltage at the load / Forward-traveling current at the load

____ = Total voltage at the load / Total current at the load

3. What is the voltage reflection coefficient? What is it a function of?

4. If $Vo^- = 4 \angle \pi$ volts, sketch the reflected wave at the load as a function of time.

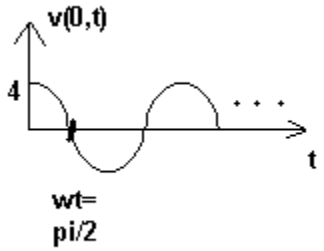


Answers:

1. Vin, V_L, Vg, $V(z)$, Vo^+, Vo^-, $|Vo^-|$
2. Zin, Zo, Zo, Zo (anywhere! Even at the load), Z_L
3. $\Gamma = Vo^- / Vo^+$
   Function of Zo and Z_L
4. $Vo^- = 4 \angle \pi = 4\, e^{j\beta z+0}$

$Vo(z,t) = 4 \cos(\omega t + \beta z + 0)$

$Vo(0,t) = 4 \cos(\omega t + \beta 0 + 0)$



Sketch: