

## LE 333 Assignment #1

1. It is found that the attenuation on a  $50\text{-}\Omega$  *distortionless* transmission line is  $0.01$  (dB/m). The line has a capacitance of  $100$  (pF/m).

- a) Find the resistance, inductance, and conductance per meter of the line.
- b) Find the velocity of wave propagation.
- c) Determine the percentage to which the amplitude of a voltage traveling wave decreases in  $1$  km and in  $5$  km.

2. Given a coaxial cable with (inner,outer) radii of  $(16,60)$  mils ( $1000$  mils =  $1$  inch) and filled with polyethylene ( $\epsilon_r = 2.26$ ) (this is the RG-58/U cable). Assume that the wire conductors are *perfect*. Determine the characteristic impedance, attenuation constant and phase constant at  $10$  MHz if the loss tangent of polyethylene at  $10$  MHz is approximately  $10^{-3}$ . Compare with the values computed if polyethylene is considered *lossless*.