2.15 Find α and Z_0 of a distortionless line whose $R' = 8\ \Omega$/m and $G' = 2 \times 10^{-4}$ S/m.

Solution: From the equations given in Problem 2.13,

$$\alpha = \sqrt{R'G'} = [8 \times 2 \times 10^{-4}]^{1/2} = 4 \times 10^{-2} \qquad \text{(Np/m)},$$

$$Z_0 = \sqrt{\frac{L'}{C'}} = \sqrt{\frac{R'}{G'}} = \left(\frac{8}{2 \times 10^{-4}}\right)^{1/2} = 200\ \Omega.$$