Indraprastha Institute of
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Lecture – 4   Date: 14.01.2016

- Review Lecture – 3
- Transmission Lines (contd.)
- Examples

Example – 1

An air line is a transmission line in which air separates the two conductors, which renders $G = 0$ because $\sigma = 0$. In addition, assume that the conductors are made of a material with high conductivity so that $R \approx 0$. For an air line with a characteristic impedance of 50Ω and a phase constant of $20 \; rad/m$ at 700MHz, find the per unit line inductance and capacitance.

Example – 2

For a lossless transmission line, λ=20.7cm at 1GHz. Find ε_r of the insulting material.

Example – 3

A lossless transmission line uses a dielectric insulating material with $\varepsilon_r = 4$. If its line capacitance is $C = 10 \, pF/m$, find (a) the phase velocity u_p, (b) the line inductance L, and (c) the characteristic impedance Z_0.