$L = 10^{-6}$ H/m

$C = 10^{-10}$ F/m

$R = 0.5\ \Omega/m$

delay time = 1 μs

} transmission line

$$Z_0 = \sqrt{\frac{L}{C}} = \sqrt{\frac{10^{-6}}{10^{-10}}} = 100\ \Omega$$

$$\hat{v}\ (\text{velocity}) = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{10^{-6} \times 10^{-10}}}$$

$$= 10^8\ \text{m/sec}$$

$$l = \hat{v} \times \text{delay} = 10^8\ \text{m/s} \times 10^{-6}\ \text{s} = 100\ \text{m}$$

$$\alpha = \frac{R}{2Z_0} = \frac{0.5\ \Omega/m}{200\ \Omega} = 2.5 \times 10^{-3}\ \text{m}^{-1}$$

$$\text{loss} \sim e^{-\alpha l}$$

so for 1 m line, $\text{loss} = e^{-2.5 \times 10^{-3}}$

$$= 0.9975$$

$$= 21.7 \times 10^{-2}\ \text{dB/m}$$

$$\text{dB} = 20 \log (\ )$$