2.2 A transmission line has the following per unit length parameters: $L = 0.2 \ \mu\text{H/m}$, $C = 300 \ \text{pF/m}$, $R = 5 \ \Omega/\text{m}$, and $G = 0.01 \ \text{S/m}$. Calculate the propagation constant and characteristic impedance of this line at 500 MHz. Recalculate these quantities in the absence of loss ($R = G = 0$).