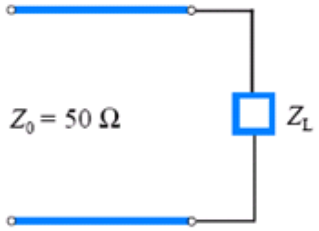
Electricity & Magnetism (ECE 107) – ECE MS Comp Exam, Fall 2013

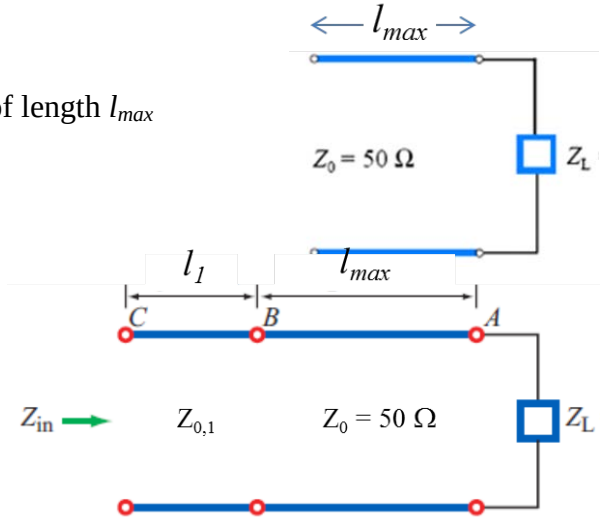
A 50-Ω lossless line is terminated with a load impedance Z_L = (50+j50) Ω.



(a) Calculate Γ and S.

(b) find a value for l_{max} where there is the first voltage maximum assuming a wavelength λ of the signal.

c) Calculate the input impedance for the transmission line of length l_{max}



d) Now add a second transmission line of length l_1 and impedance $Z_{0,1}$. Choose values for l_1 (in terms of λ) and impedance $Z_{0,1}$ so that the input impedance at point C would match a 50-Ω transmission line.

e) Assuming that the two transmission lines shown in (d) are connected to a 50-Ω transmission line that is connected to a signal generator (Z_g= 50 Ω and Vg=10 V), how much power is being delivered to the load?