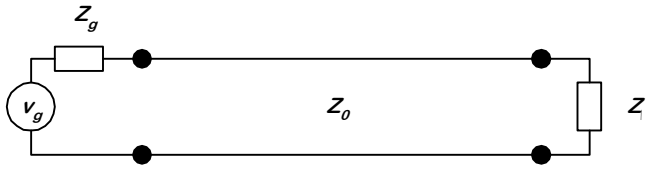
EE 405 -Microwave Transmission

Assignment # 3:

Solve the following problems using HAND-CALCULATION and CAEME software and Tabulate the answers

1. A transmission line is 0.25λ long and terminated in a load impedance of (100 + j100) Ω. The characteristic impedance of the line is Z_0 = 50 Ω. The propagation constant γ = 0 + j20.9 /m. Find the reflection coefficient at the load, the input impedance of the line, the reflection coefficient at the input. Calculate the VSWR at the load and the input terminals.
2. Repeat case (1) after changing the propagation constant to γ = 0.05 + j20.9 /m.
3. A high frequency transmission line has R = 5 Ω/m, L = 5.2x10^{-8} H/m, G = 6.2x10^{-3} S/m, and C = 2.13x10^{-10} F/m. The signal frequency is 4 GHz and the load impedance is (100 + j100) Ω. Calculate Z_0 of the line and the propagation constant γ, the normalised load impedance, the reflection coefficient at the load, the sending end impedance and the reflection coefficient at the sending end of the line.



4 Analyze the transmission line configurations shown in figure 2 and 3. Assume the lines have propagation constant of γ=0+j20, find the input impedances of point A, B, C.

5. Compare the values of Z_{in}'s at point A & B of figure 3 and compare characteristics of the 0.25λ and λ length transformers.

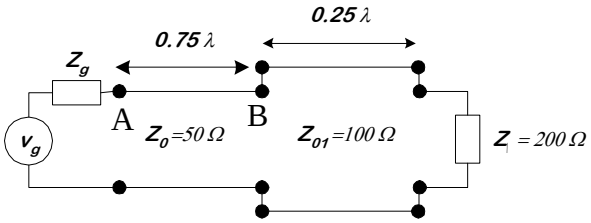


Figure 2

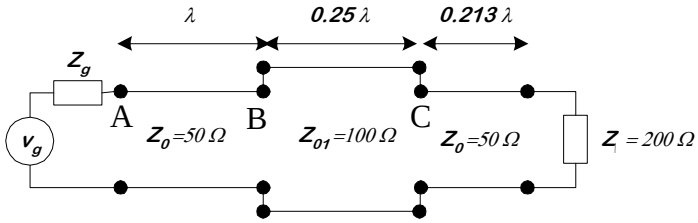


Figure 3

Data Table	**Calculate, Z_{in}**	**Simulated, Z_{in}**
At point **B** of figure 2		
At point **A** of figure 2		
At point **C** of figure 3		
At point **B** of figure 3		
At point **A** of figure 3		