Homework 5.

- 1) A lossless transmission line with $Z_0 = 50\Omega$ is 10 m long and operates at 1 MHz. The line is terminated with a load $Z_L = 50 + j50\Omega$. If the phase velocity is 0.5C on the line, find
 - (a) The reflection coefficient Γ .
 - (b) The standing wave ratio VSWR.
 - (c) The input impedance Z_{in}.
- 2) A lossless transmission line with $Z_0 = 50\Omega$ is terminated with a short circuit. Find the input impedances for the line lengths of $\lambda/8$, $\lambda/4$, $\lambda/2$ and λ .
- 3) A lossless transmission line with $Z_0 = 50\Omega$ is terminated with an open circuit. Find the input impedances for the line lengths of $\lambda/8$, $\lambda/4$, $\lambda/2$ and λ .
- 4) A 50 Ω lossless line has VSWR=1.5 and $\theta_{\Gamma} = 100^{\circ}$. If the line is 0.5 λ long, find Γ , Z_{L} and Z_{in} .
- 5) A load impedance of $Z_L = 180\Omega$ is to be matched to a 50 Ω coaxial cable by a quarter-wave transformer, find the characteristic impedance Z_{01} .

