

ENEE 381 Problem Set #5

4/17/03 due 4/24/03

Questions like (5), (7) and (8) could be on the second exam.

(1) Cheng 8.26

(2) Cheng 8.27

(3) Cheng 8.28

(4) Cheng 8.30

(5) Cheng 8.36

(6) A transmission line of characteristic impedance 75ohm is terminated with an inductor of $0.1\mu\text{H}$ and 50ohm in series. The frequency of operation is 100MHz. Calculate without using the Smith Chart:

(a) $|\rho|$

(b) ϕ

(c) The standing wave ratio

(d) Where on the line closest to the load can the line be matched with the shortest possible shorted stub connected in parallel to the line?

(e) What is the length of this stub?

(7) Repeat (6) with the Smith Chart

(8) A plane wave is incident on the boundary between air and a plastic ($\epsilon_4=10$) at an angle of incidence of 45° . The wave is incident from the air side. Use the Smith chart to find:

(a) $|\rho|$

(b) ϕ

(c) The standing wave ratio

(d) The location of the nearest magnetic field maximum to the boundary