

## ENEE 381, Spring 2004. Homework Set 3

Due Tuesday March 30, 2004

- (1) Cheng Problem 8-20
- (2) Cheng Problem 8-22
- (3) Cheng Problem 8-25
- (4) Cheng Problem 9-23
- (5) Cheng Problem 9-24
- (6) Cheng Problem 9-26
- (7) A transmission line of  $Z_0=75\text{ohm}$  is terminated in a load of  $60+j50\text{ ohm}$ . What are
  - (a)  $\rho$
  - (b)  $|\rho|$
  - (c)  $\phi$
  - (d) The VSWR
- (8) A transmission line of  $Z_0=50\text{ohm}$  is terminated with a capacitor of  $10\text{nF}$  in parallel with an inductor of  $10\text{nH}$ . The line is being operated at  $100\text{MHz}$ . Calculate:
  - (a)  $\rho$
  - (b)  $|\rho|$
  - (c)  $\phi$
  - (d) The VSWR
- (9) A transmission line of characteristic impedance  $50\text{ ohm}$  is terminated with a load  $Z_L$ . The line is being driven at a frequency of  $100\text{ MHz}$ . The line is found to be matched by adding an inductance in parallel to the line at  $0.1\lambda$  from the load. The inductance needed is  $79.58\text{ nH}$ . What is the value of the load? What is the reflection magnitude and phase at the load when the line is unmatched? What is the standing wave ratio when the line is unmatched?