ECE 580 Network Theory

MIDTERM EXAMINATION

October 23, 2009

Open book

1. In the terminated two-port shown below, the input impedance is $Z_1$.
   
   a. At what frequencies is $Z_1 = R$ for all values of $R$?
   
   b. For what value of $R$ does $Z_1 = R$ hold at all frequencies? Why?

   ![Two-port circuit diagram]

2. What is the input impedance of the circuit shown below? What are its possible applications?

   ![Complex circuit diagram]
3. (Extra credit) Find all node voltages in the circuit shown below.