

610 Fall 2014 – Homework 3 Due Th 09/25/14

1. (50 points, Reduction of Semistate Equations)
 - a) Reduce the semistate equations set up in class on Tu 09/16/14 to obtain the input admittance $y(s) = [sC\{g_m + G(1+sLg_m)\}]/[(sC+G)(1+sLg_m)]$.
 - b) Give the poles and zeros of the input impedance.
 - c) By a scaling of frequency (here s) and an admittance level scaling show that $C=1$ and $G=1$ can be obtained.

2. (50 points, output impedance via coupling circuit)

For the following circuit,

 - a) Find the impedance $Z(s)$ matrix for the coupling 2-port
 - b) Find the input impedance $z(s)$ in terms of the load impedance $z_L(s)$.
 - c) Find the load $z_L(s)$ in terms of the input $z(s)$ and arrange this to look like a Richards' function.

