Spring 2015 M.S. Comprehensive Exam

Electronic Circuits and Systems (ECE 166/265)

Problem 1:

a) Design *an LC matching network* which matches a load of Z_L = 30-j150 Ω to a generator impedance of 60+j40 Ω. Do not design two independent matching networks with each one to 50 Ω. Use the Smith Chart.

b) Consider the following 4-port network with general S-parameters and $S_{22}=S_{44}=0$ and $S_{23}=S_{43}=0$. Calculate S_{11} of the network when connected as follows. Use the S-parameter matrix or follow the waves (all of them). Note that S_{42} and $S_{24}$are <u>not</u> equal to zero.