Note Title 9/2/2019

ENEE 610 Fall 2019 Homework 3 Due Tu 09/24/19

#1(50 points; constant R circuits)

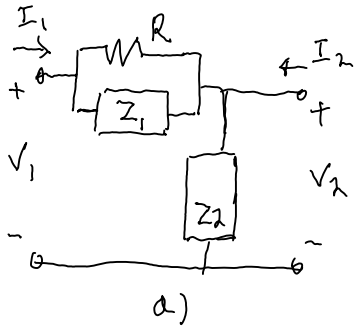
For the following circuits

a) Give the 2-port impedance matrices.

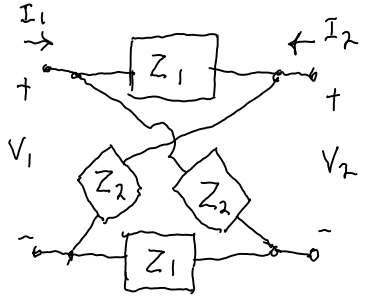
b) Load port 2 in a resistor of resistance $R_{load} = R$ and find the input impedanc Z_{in}.

c) Calculate the element values such that $Z_{in} = R$ when $Z_1/R=R/Z_2$

d) With those element values give V_2/V_1 for each R-loaded 2-port and evaluate for an inductive $Z_2=Ls$



a)



b) = lattice

#2 (50 points, bridge T circuit).

Choose $C_1=1/(2a)$, $C_2=2a/b$, $L_1=a/b$ and $L_2=(1/2)[(1/a)-(a/b)]$ with a=2 and b=1, in which case the mutual L2<0}

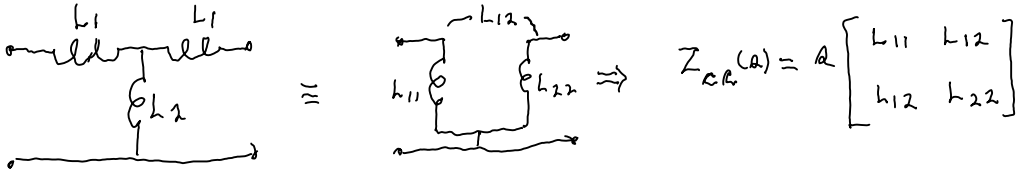
Also the coupled coils equivalent of circuit a) is used for the bridge T of circuit b).

a) Give $L_{11}=L_{22}$ and $L_{21}=L_{12}=M$ in terms of L_1 and L_2.

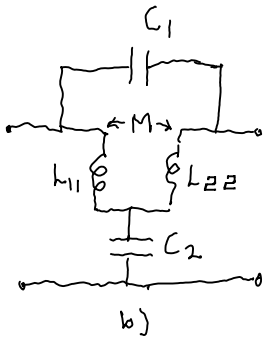
b) By finding the impedance matrix for the non-C_1 portion and then adding admittance matrices obtain the 2-port admittance of the bridge T.

c) Load in a resistor of G Mho conductance and calculate $V_2/V_1(s)$: give its zeroes and poles under open circuit load conditions (G=0).

d) When loaded in the G Mho resistor calculate the input admittance, $y_{in}(s)$, looking into its first port.



a)



b)