Study guide for the 1st in-class quiz for ECE 432/532 (3rd week)

Spring 2016

This quiz has a bit of material from 431/531 with just a few topics from the first few lectures in 432/532. Quizzes serve dual purpose: a) to make you review the material covered in class up to this point, and b) to check that you have some basic understanding of the material. Given that the quiz is around 30 minutes long we don't have time to ask long questions. Instead, the emphasis is on shorter, more focused and qualitative questions. There will be a mixture of multiple-choice, calculation and short explanation questions. Material covered is not just from lectures but also from the labs.

You should be able to answer the following questions and know how to implement the design procedures (chapters are given as "P 2.4" for Pozar's book, "B 2.4" for Bowick's book , "R 2.4" for Rizzi's book and "G 2.6: for Gonzalez' book):

1. Identify impedances, admittances, and reflection coefficients on Smith chart (P 2.4, R 3.7,)
2. Locate impedances and admittances on Y-Z Smith chart (B 4, P 2.4)
3. Be able to determine which L circuits can be used for matching specific impedances (B 4, P 5.1)
4. Design lumped "L" matching circuits using YZ Smith chart (B 4, P 5.1)
5. Be able to calculate Γ_{IN} and Γ_{OUT} from given S parameters and load or source impedance (G 2.6, 3.2)
6. Understand the concepts of unconditional stability and potential instability and ability to determine if a device is unconditionally stable or not. (G 3.3)
7. Be able to identify stability region from Smith chart and S parameters (G 3.3)
8. Calculate K, Δ and μ for unconditional stability (G 3.3)
9. Construct stability circles on input and output (G 3.3,
10. Use stability circles to determine values of resistances for resistive loading on input and output that would make device unconditionally stable (G 3.3)
11. Calculate various gains from their definition and understand the conditions under which they are defined (G 3.2)