WH 11 due to 12/21 (submit online at NTUCOOL before 9 am)

1. Design an impedance matching circuit for $Z_L = (30+40j)\Omega$ via (a) analytical solution and (b) Smith chart in ADS.
   The operation frequency is at 2.4 GHz. (you can use lumped element, transmission line, or mixed.)

2. Based on the impedance matching circuit in 1, implement it with microstrip line with RF-4 substrate with relative permittivity of 4, thickness of 1.6 mm, $\tan\delta = 0.001$ via (a) ADS and (b) CST. (The impedance needs to convert into series lumped element in CST. You need to add an additional 50 Ω transmission line as feeding line for discrete port.) Plot the S_{11} spectrum from 1 GHz to 3 GHz and discuss the differences.