ENEL434 Electronics II

No marks Homework

Given
$S_{11} = 0.45 \,\underline{/150^\circ}$,
$S_{12} = 0.01 \,\underline{/\text{-}10^\circ}$,
$S_{21} = 2.05 \,\underline{/10^\circ}$,
$S_{22} = 0.40 \,\underline{/\text{-}150^\circ}$

at f = 10GHz and Zo = 50 Ohms

1) Assume Z_L = 50 Ohms and find the length Ds of an open circuit stub and the length Ls of a transmission line that will conjugate match the input as shown in Figure 1. Always use the shortest length stub you can.
2) Now using the source matching network you found in (1), calculate the length Do of the open circuit stub and length of the transmission line Lo that will conjugate match the output of the transistor as shown in Figure 2.

You may use Matlab to help calculate Gamma_in and Gamma_out and you will need to supply two Smith charts as part of your answer showing how you determined the length of stubs and lines. Smith charts are available on the courses folder (W:drive) under ENEL434.
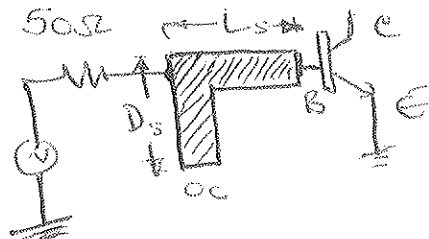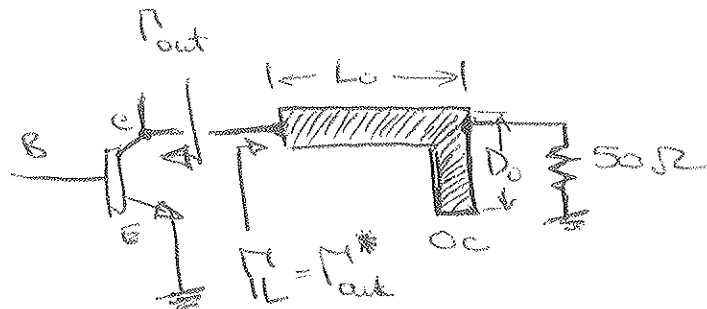

Fig 1 Input Matching Network.

Fig 2 Output Matching Network.