

ECE386  
Homework2  
2014-2015 spring  
**Due date: 29-05-2015**

Question-1) Find the root-locus plot of the transfer functions below and also determine for which values of K these systems are stable in a closed negative-unity feedback loop.

a)  $T(s) = \frac{K}{s(s+10)}$

b)  $T(s) = \frac{K}{(s+1)^3}$

c)  $T(s) = \frac{Ks}{(s-1)(s-2)}$

Question-2) Find the Nyquist plots of each of the transfer functions in Question-1 and determine for which values of K these systems are stable in a closed negative-unity feedback loop.

Question-3) Obtain the magnitude and phase characteristics of the systems below. Also draw their Bode plots (both the magnitude and phase characteristics in logarithmic scale)

a)  $T(s) = \frac{1}{s(s+10)}$

b)  $T(s) = \frac{1}{(s+1)^3}$

c)  $T(s) = \frac{250s}{(s+5)(s+50)}$