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