MATLAB ASSIGNMENT NO.2
CLASS: S.S. B.E.III ELECTRICAL

Problem 01:
Plot the root locus for a unity feedback system with open loop transfer function $G(s) = K(s+0.4)/\{s^2(s+3.6)\}$. Determine the dominant poles corresponding to $\zeta = 0.5$ and $\omega_n = 1$rad/sec. Comment on the plot.

Problem 02:
Re-plot the above root locus with user defined values of K (*for critical values of K where plot may appear to be discontinuous*). Compare both the plots.

Problem 03:
Plot the root locus for a unity feedback system with open loop transfer function $G(s) = K(s^2+2s+4)/\{s(s+4)(s+6)(s^2+1.4s+1)\}$. Hence determine the range of K for which the system is stable.

Problem 04:
Consider a unity feedback system with plant transfer function as $G(s) = 1/\{s(s+1)(s+5)\}$ and the controller transfer function $G_c(s) = K(s+a)^2/s$. Using matlab program, determine the values of K and a such that the unit step response will exhibit max overshoot between 10% and 2% with settling time less than 3 seconds. Also plot the step response curves of the designed system with chosen values of K and a.

Problem 05:
Modify above program to find the largest overshoot (less than 10%) and the smallest overshoot(less than 2%). [Hint: use the sorting function].