EE 3657

Homework # 6 – Assigned Fri Jul 19 - Due Th Jul 25

Covers Compensator Design by Root Locus. Your notes and the textbook should be ample material to solve these problems.

1. Given a unity feedback system with $G(s)=\frac{1}{s^2(s+4)}$, design a cascade compensator to obtain the following specs: (a) max overshoot $M_p \le 25\%$, and (b) $t_s \le 5\,\text{sec}$. Any of the possible multiple design solutions are acceptable. You need to verify using MATLAB that the design criteria are indeed met, if not, redesign until they are.

2. Given a unity feedback system with $G(s)=\frac{16}{s(s+4)}$, design a cascade compensator so that the dominant complex conjugate closed-loop pole pair of the uncompensated system is not much altered while the static velocity error constant is desired to be $K_v = 20\,\text{sec}^{-1}$.