ECE 461 - Homework Set #8

Lead, PID, Meeting Design Specs - Due Monday, November 2nd

Problem 1-4) Let $G(s) = \left(\frac{100}{(s+1)(s+4)(s+8)(s+9)} \right)$

1) Design a I compensator $\left(K(s) = \frac{k}{s} \right)$ which results in 20% overshoot for a step input. Check you answer in VisSim or MATLAB (i.e. take the step response of the closed-loop system).

2) Design a PI compensator $\left(K(s) = \left(\frac{as+b}{s} \right) \right)$ which results in 20% overshoot for a step input. Check you answer in VisSim or MATLAB (i.e. take the step response of the closed-loop system).

3) Design a compensator which results in

- No error for a step input
- 20% overshoot for a step input, and
- A 2% settling time of 2 seconds.

Check you answer in VisSim or MATLAB (i.e. take the step response of the closed-loop system).

4) Design an op-amp circui to impliment K(s) for problem 3.

Problem 5-8) Let $G(s) = \left(\frac{100}{s(s+1)(s+4)(s+8)} \right)$

5) Design a lead compensator $\left(K(s) = k\left(\frac{s+a}{s+10a} \right) \right)$ which results in 20% overshoot for a step input. Check you answer in VisSim or MATLAB (i.e. take the step response of the closed-loop system).

6) Design a compensator which results in

- No error for a step input
- 20% overshoot for a step input, and
- A 2% settling time of 2 seconds.

Check you answer in VisSim or MATLAB (i.e. take the step response of the closed-loop system).

7) Design an op-amp circui to impliment K(s) for problem 6.