EE3331C Feedback Control Systems Assignment 3

Let a be the last digit of your matric number. If any digits is 0, replace by 1. For example, if your matric number is A1234560Z, then $a = 1$.

In this assignment, we are going to design the lead and lag compensators in the lecture notes.

Consider the following feedback system (see page 11-18) where $G(s) = \dfrac{1}{s(s+a)}$, $K(s) = K$. The design specifications are

- velocity error constant, $K_v = 20$,
- phase margin of at least 50^o.

(a) Design a lead compensator to meet the above specifications.

(b) Design a lag compensator to meet the above specifications.

(c) Simulate your results in Matlab and show the Bode plots of the compensated systems and uncompensated system, similar to the Figure on page 11-32 of our lecture notes.

You may write down workings on A4 papers, scan (e.g. Office Lens or CamScanner App) your results together with your matlab plots and code (add comments to your code so that it is readable!) into a pdf file, name it as A1234567Z.pdf where A1234567Z is your matric number. Submit to the assignment 3 folder in CANVAS by 22 Nov 2023 12noon.