I. OBJECTIVE

The objective of this project is to design a digital phase-lead controller, D(z), using the root locus (in the z-plane) for the system shown in Figure 1. The transfer function of the plant is given by $G_p(s) = 52/(s(s+0.3))$. It is required that the compensated system satisfy the following performance specifications.

1. Steady-state error to a step input = 0
2. Percentage overshoot to a step input < 5%
3. Settling time < 1sec

Also, the following specs should be met

4. G.M. > 15 db
5. P. M. > 45°

![Figure 1. Block diagram of the compensated system for project 3.](image)

II. REPORT

Your report should contain the transfer functions of the digital controller, the results, conclusions and references.