

ME 360: FUNDAMENTALS OF SIGNAL PROCESSING, INSTRUMENTATION, AND CONTROL

Experiment No. 5 Speed Control of a DC Electric Motor Pre-lab Questions

These short answer questions must be completed and turned in at the beginning of the laboratory period.

1. What type(s) of control are studied in this experiment? (5 pts)
2. What is the purpose of the power amplifier? (5 pts)
3. Draw a block diagram of the PID controller. Identify the proportional, integral, and derivative components. (10 pts)
4. If $K = 1.15$, $\tau = 0.050$ s, and $r = 1250$ rpm, what is the closed-loop steady-state error if $K_p = 10$, $K_I = 0$, and $K_D = 0$? (5 pts)
5. If $K = 1.15$ and $\tau = 0.050$ s, and $r = 1250$ rpm, what is the closed-loop steady-state error if $K_p = 10$, $K_I = 20$, and $K_D = 0$? (5 pts)