

EE 301P: Control Systems Laboratory

Lab Exercise 6

Lab session: October 6, 2023

Report due: October 13, 2023

1 Objective:

To understand the process to control the given dc motor(s) using Arduino and Simulink in open and closed loop form.

2 Lab exercises

- (a) Open loop control test scenario: control the given motor at different speed and then reverse the polarity of the input voltage.
- (b) Closed loop control test scenario: Utilize the encoder(s) feedback to control the speed of the given motor(s) using P-only controller and then PI controller.
- (c) Apply the disturbance to the system and observe the response in case of closed loop control test scenario.

3 Required hardware

- (a) DC motor(s)
- (b) Motor driver
- (c) Arduino
- (d) Breadboard
- (e) Couple of jumper wires

4 Deliverables

Lab report should include

- (a) Matlab code/ Simulink model
- (b) Tuned value of parameters
- (c) Set point information
- (d) Obtained plots to show the performance with respect to the set point (reference).