Final Exam – Simulation Results

ECEn 483/ ME 431

Fall 2024

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

At the end of the exam, make sure to include this file with your submission.

# Part 2. Design models

2.2 Insert plot of the output of the simulation model with initial condition  and input directly below this line.

2.6 Insert the code you used for simulating the dynamics (this should nominally be massDynamics.py, unless you chose to use the complied version and lose 10 points):

# Part 3. PID Control

3.6 Insert a plot that shows both and when is a square wave with magnitude meters and frequency 0.05 Hz, and when using a PD controller.

3.7 Insert a plot that shows both and when is a square wave with maginitude meters and frequency 0.05 Hz, and when using a PID controller.

3.8 Insert the controller code that implements PID control directly below this line.

# Part 4. Observer based control

4.5. Insert a plot of the step response of the system for the complete observer based control.

4.6. Insert a plot of the state estimation error.

4.7. Insert a copy of your controller code which includes both the state feedback controller AND the observer.

# Part 5. Loopshaping

5.6 Insert the Bode plots for the original plant, the PID controlled plant, and the loopshaped controlled plant below this line.

5.7 Insert simulation results for the loopshaping controller below this line.

5.8 Insert a copy of your loopshaping AND controller code below this line.

# 6. Insert your code that computes all control gains for each of the other parts here. And make sure to upload all of your code as part of your submission. Include all relevant files in the “python” folder.