Practice Final Exam – Simulation Results

ECEn 483/ ME 431

Winter 2023

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

At the end of the exam, print this file and stable it to the handout portion of the exam.

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| Part I (25 pts) |  |
| Part II (25 pts) |  |
| Part III (25 pts) |  |
| Part IV (25 pts) |  |
| Total: (100 pts) |  |

# Part 1. Design models

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

# Part 2. PID Control

2.4 Insert a plot that shows both and when is a square wave with magnitude degrees and frequency 0.1 Hz, and when using a PD controller.

2.5 Insert a plot that shows both and when is a square wave with maginitude degrees and frequency 0.1 Hz, and when using a PID controller.

2.6 Insert the Python code for ctrlPID.py that implements PID control directly below this line.

# Part 3. Observer based control

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

3.6 Insert a plot of the state estimation error.

3.7 Insert a copy of ctrlObsv.py that implements the observer based controller directly below this line.

# Part 4. Loopshaping

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

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

4.8 Insert the file loopshapeRodMass.py for the controller below this line.