EE 362K
Homework 5 Rubric

Q1

- Controllability matrix
- Argument for why it is/is not reachable

Q2

- Observability matrix
- Argument for why it is/is not observable

Q3

- Explanation of what it means to be observable but not controllable
- Explanation of what it means to be controllable and not observable
- Explanation of why the determined coordinate transformation cannot be used to formulate system in RCF

Q4

(a)

Argument for observability for each C

(b)

- Steps to find OCF
- Finding transformation matrix, T from this

(c)

- Identification of whether the observer is functional
- Justification of why the observer is (not) functional

(d)

- Eigenvalues that you want to attain
- Steps to find corresponding L
- Plots of estimator and true trajectory to verify functionality of observer

Q5

Use values of constants stated in HW4 for the two-compartment model.

- Identify A,B,C,D for state space representation
- Choice of eigenvalues for observer and controller
- Steps to derive K and L
- Correct initalization of states and estimates
- Formulation of equations governing system with both controller and observer
- Graphs demonstrating that the system with controller and observer performs as prescribed
- Additional points for plot showing the convergence of observer to true trajectory

Q6

Please look at the 1st edition of the textbook.

- Steps to derive K and L
- Formulation of equations governing system with both controller and observer
- Graphs demonstrating that the system with controller and observer performs as prescribed