Homework #3
ME EN 5210/6210 & CH EN 5203/6203 & ECE 5652/6652
Linear Systems & State-Space Control

Use this page as the cover page on your assignment, submitted as a single pdf.

Problem 1
Do problems 3.5 and 3.6 (together) from the textbook.

Problem 2
Do problem 3.7 from the textbook.

Problem 3
Do problem 3.8 from the textbook.

Problem 4
For the discrete system

$$\boldsymbol{x}[k+1] = A\boldsymbol{x}[k] + Bu[k]$$

$$y[k] = C\boldsymbol{x}[k] + Du[k]$$

where

$$A = \begin{bmatrix} -0.5 & -0.1 \\ 0 & 0.5 \end{bmatrix}, B = \begin{bmatrix} 0 \\ 5 \end{bmatrix}, C = \begin{bmatrix} 1 & 10 \end{bmatrix}, D = 4$$

(a) Compute the transfer function from in the input $u[k]$ to the output $y[k]$.

(b) Using the answer from part (a), compute the input-output equation.