Set #1

Due Friday September 12, 2015

Make note of the following:
• We will begin discussion of these problems in class on Friday September 5
• Write only on one side of the paper
• Please try if possible to start each new problem on a clean sheet of paper
• Use engineering paper if you like

Problems (5th edition of Haykin):
1. Text Chapter 1 problem 1.
2. Text Chapter 1 problem 5. Hint for part (a) begin by writing

\[
\mathbf{I}_{M+1} = \begin{bmatrix}
\mathbf{r}(0) & \mathbf{r}^H \\
-\mathbf{r} & \mathbf{R}_M \\
\end{bmatrix}
\begin{bmatrix}
\mathbf{a} & \mathbf{b}^H \\
\mathbf{b} & \mathbf{C} \\
\end{bmatrix}
\]

where \( \mathbf{I}_{M+1} \) is the \( M + 1 \times M + 1 \) identity matrix and

\[
\mathbf{R}^{-1}_{M+1} = \begin{bmatrix}
\mathbf{a}^H \\
\mathbf{b}^H \\
\end{bmatrix}
\begin{bmatrix}
\mathbf{C} \\
\mathbf{C} \\
\end{bmatrix}
\]

4. Text Chapter 1 problem 7.
5. Text Chapter 1 problem 10. To stay consistent with the 4th edition let

\[
x[n] = v[n] + 0.75v[n-1] + 0.25v[n-2]
\]

so the coefficient on \( v[n-2] \) is 0.25, not 0.75.
6. Text Chapter 1 problem 11.
7. Text Chapter 1 problem 17.