ECE 2200 **HOMEWORK ASSIGNMENT VI** **Fall 2019**

Reminder: the book uses $H(e^{j\widehat{\omega}})$ for what I've been calling $\widehat{H}(\widehat{\omega})$ in class.

1. From the book, Problem P-6.4. In part (c), no need to hand in the MATLAB part, but do it if you can.

2. From the book, Problem P-6.5.

3. From the book, Problem P-6.8.

4. From the book, Problem P-6.14.

5. An FIR system has frequency response

$$\widehat{H}(\widehat{\omega}) = \left(1 - e^{j\pi/2}e^{-j\widehat{\omega}}\right)\left(1 - e^{-j\pi/2}e^{-j\widehat{\omega}}\right)\left(1 + e^{-j\widehat{\omega}}\right) .$$

Use linearity to find the output signal $y[n]$ that arises when the input signal is

$$x[n] = 7 + 13\cos(.5\pi n + .25\pi) + 11\delta[n-3] .$$

6. Find an FIR system with I/O relationship

$$y[n] = \sum_{k=0}^{4} b_k x[n-k]$$

that annihilates every discrete-time phase-shifted cosine with normalized frequency $\pi/3$ or $\pi/7$. When I say "find the system," I mean find the b_k, $0 \leq k \leq 4$. When I say "annihilates," I mean "gives zero output in response to."