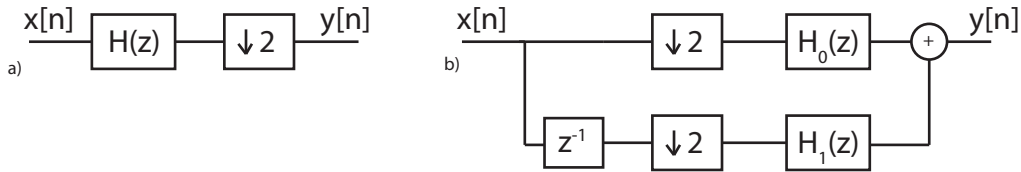


ECEn 487 - Introduction to Digital Signal Processing

Winter 2013

Quiz 4

1. (5 pts) Suppose you have the following system in (a) with response $y[n] = 1x[n] + 2x[n-1] + 3x[n-2] + 4x[n-3]$. For efficiency, you decide to use a polyphase decomposition shown in (b). What will the linear equations be for the filters $H_0(z)$ and $H_1(z)$?



2. (5 pts) Suppose you have a filter with the following properties:

$$H(z) = \frac{(1 - 0.3z^{-1})(1 + 4z^{-1})}{(1 - 0.7e^{j\pi/4}z^{-1})(1 - 0.7e^{-j\pi/4}z^{-1})}$$

Since $H(z)$ is non-minimum phase, please (I'm asking politely) convert $H(z)$ into the form $H(z) = H_1(z)H_{ap}(z)$ where $H_1(z)$ is a minimum phase filter and $H_{ap}(z)$ is an all-pass filter.