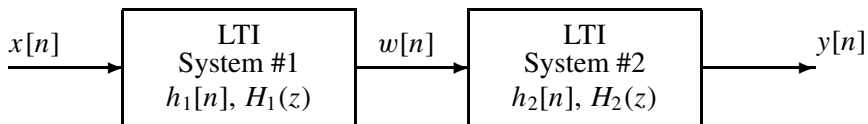# PROBLEM:

A cascade of two discrete-time systems is depicted by the following block diagram:

The systems are defined by the following:

$$H_1(z) = (1 + z^{-2}) \quad \text{and} \quad h_2[n] = (0.5)^{n-1}u[n-1].$$

(a) If the input to the first system is

$$x[n] = \delta[n] + 2\delta[n-1] - \delta[n-2],$$

determine the output, $w[n]$, of the **first** system.

$$w[n] = \delta[n] + 2\delta[n-1] + 2\delta[n-3] - \delta[n-4]$$

(b) Determine the system function $H(z)$ of the overall system.

$$H(z) = (1 + z^{-2}) \cdot \frac{z^{-1}}{1 - 0.5z^{-1}}$$