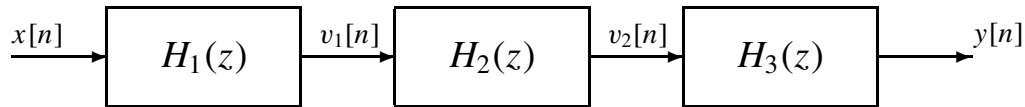


PROBLEM:

In the following cascade of systems, all systems are defined by their transfer functions.



$$H_1(z) = \frac{5}{1 - \frac{1}{3}z^{-1}}$$

$$H_2(z) = \frac{2}{1 - \frac{1}{2}z^{-1}}$$

$$H_3(z) = b_0 + b_1z^{-1} + b_2z^{-2} + b_3z^{-3}$$

- (a) Determine the unknown coefficients $\{b_k\}$ so that the output signal $y[n]$ will be the delayed impulse, $\delta[n - 1]$, when the input signal $x[n]$ is an impulse, i.e., $x[n] = \delta[n]$.
- (b) Using part (a), determine whether the following statement is true or false:
“For any input signal $x[n]$, the output is always $y[n] = x[n - 1]$ ”
Give a solid reason to back up your choice of true or false.