

به نام خدا

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تحلیف سری دوم سیگنالها و سیستمها

مهلت تحویل: ۱۸ اردیبهشت ۱۳۹۸



2.3. Consider an input $x[n]$ and a unit impulse response $h[n]$ given by

$$x[n] = \left(\frac{1}{2}\right)^{n-2} u[n-2],$$

$$h[n] = u[n+2].$$

Determine and plot the output $y[n] = x[n] * h[n]$.

2.4. Compute and plot $y[n] = x[n] * h[n]$, where

$$x[n] = \begin{cases} 1, & 3 \leq n \leq 8 \\ 0, & \text{otherwise} \end{cases},$$

$$h[n] = \begin{cases} 1, & 4 \leq n \leq 15 \\ 0, & \text{otherwise} \end{cases}.$$

2.21. Compute the convolution $y[n] = x[n] * h[n]$ of the following pairs of signals:

(d) $x[n]$ and $h[n]$ are as in Figure P2.21.

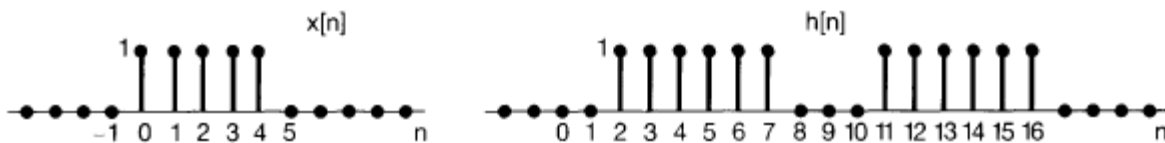
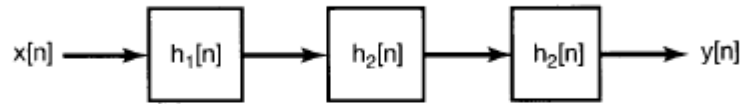


Figure P2.21

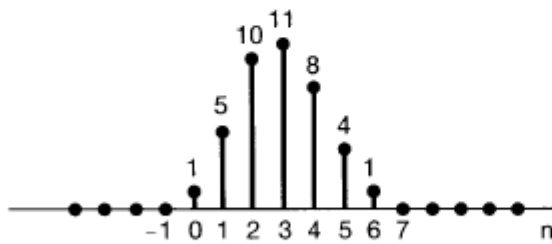
2.24. Consider the cascade interconnection of three causal LTI systems, illustrated in Figure P2.24(a). The impulse response $h_2[n]$ is

$$h_2[n] = u[n] - u[n - 2],$$

and the overall impulse response is as shown in Figure P2.24(b).



(a)



(b)

Figure P2.24

- (a) Find the impulse response $h_1[n]$.
 (b) Find the response of the overall system to the input

$$x[n] = \delta[n] - \delta[n - 1].$$