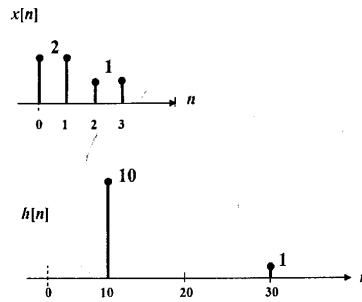


Name: Key

EE322 Fall 2008 Quiz 05

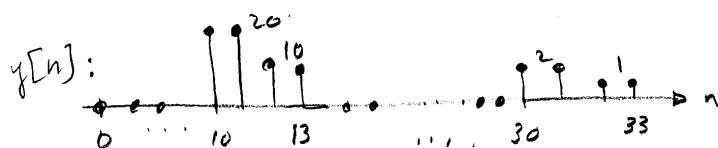
1. Find  $y[n] = x[n] * h[n]$ , with  $x[n]$  and  $h[n]$  as shown in the figure to the right:



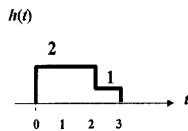
$$h[n] = 10 \delta[n-10] + \delta[n-30]$$

$$x[n] * (10 \delta[n-10] + \delta[n-30])$$

$$= 10x[n-10] + x[n-30]$$



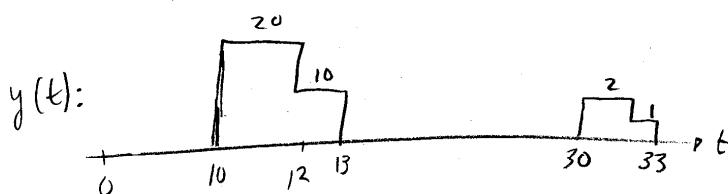
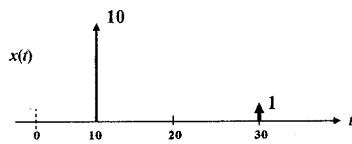
2. Find  $y(t) = x(t) * h(t)$ , with  $x(t)$  and  $h(t)$  as shown in the figure to the right:



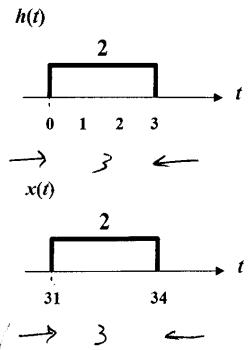
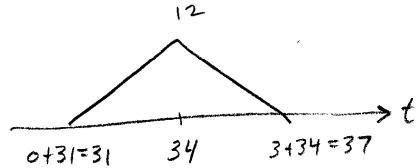
$$h(t) = 10 \delta(t-10) + \delta(t-30)$$

$$x(t) * [10 \delta(t-10) + \delta(t-30)]$$

$$= 10x(t-10) + x(t-30)$$



3. Find  $x(t) * h(t)$ , with  $x(t)$  and  $h(t)$  as given to the right:



4. A system has an impulse response given by  $h(t) = u(t) - u(t-100)$ . Is the system BIBO stable?

$$\int_{-\infty}^{\infty} |h(t)| dt = \int_0^{100} 1 dt = 100 < \infty$$

Yes, BIBO stable

5. A system has an impulse response given by  $h[n] = 3^n u[n]$ . Is the system BIBO stable?

$$\sum_{n=-\infty}^{\infty} |h[n]| = \sum_{n=0}^{\infty} 3^n = \infty \Rightarrow \text{not BIBO stable}$$

a geometric series, but ratio term has magnitude  $> 1$