

سریسم

(۱) فرض کنید  $h[n] = 2\delta[n+1] - s[n-2]$  و  $x[n] = \delta[n] + 2\delta[n+1]$   
است. محاسبه کنید  $x[n+1] * h[n-1]$  را به سبب زیر در رسم کنید.

$$x[n+1] \Rightarrow x[n+1] = \delta[n+1] + 2\delta[n+2]$$

$$h[n-1] \Rightarrow h[n-1] = 2\delta[n] - s[n-3]$$

$$\underbrace{x[n+1]}_N * \underbrace{h[n-1]}_{N'} = x[N] * h[N'] \rightarrow \int_{-\infty}^{+\infty} x(\lambda) h(t-\lambda) d\lambda$$

$$\left. \begin{array}{l} t+1=\lambda \rightarrow x(\lambda) \\ t-1=t-\lambda \quad h(t-\lambda) \end{array} \right\} \int_{-\infty}^{+\infty} (\delta[\lambda+1] + 2\delta[\lambda+2]) (2\delta[t-\lambda] - s[t-\lambda-3]) d\lambda$$

$$\int_{-\infty}^{+\infty} (\delta[\lambda+1] 2\delta[t-\lambda] - \delta[\lambda+1] s[t-\lambda-3] + 2\delta[\lambda+2] 2\delta[t-\lambda] - 2\delta[\lambda+2] s[t-\lambda-3]) d\lambda$$

۵) ماینگ یک سیستم LTI است با ماینگ فزید  $h[n] = (3)^n u[-n+2]$  به معنی

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

$$g[n] = \sum_{k=-\infty}^{+\infty} n[k] h_k[n]$$

$$= \sum_{-\infty}^{+\infty} \left(\frac{1}{2}\right)^{n-1} (u[n] - u[n-1]) \times (3)^n u[-n+2]$$

$$= \sum_{-\infty}^{+\infty} \left( \left(\frac{1}{2}\right)^{n-1} u[n] - \left(\frac{1}{2}\right)^{n-1} u[n-1] \right) \cdot 3^n u[-n+2]$$

$$= \sum_{-\infty}^{+\infty} (3)^n \times \left(\frac{1}{2}\right)^{n-1} u[n] u[-n+2] - (3)^n \left(\frac{1}{2}\right)^{n-1} u[n-1] u[-n+2]$$

$$\sum_{-\infty}^{+\infty} (3)^n \times \left(\frac{1}{2}\right)^{n-1} u[-n+2] - \sum_{-\infty}^{+\infty} (3)^n \left(\frac{1}{2}\right)^{n-1} u[-n+2]$$

$$\sum_{-\infty}^{+\infty} (3)^n \times \left(\frac{1}{2}\right)^{n-1}$$

(۴) مخرج است LTI سیمه ضلع: با مخرج

$$h(t) = e^{t+1} (u(t) - u(t-d))$$

$$u(t-d) = e^{t-d+1} (u(t-d) - u(t-d-d))$$

$$h(t) = 2e^{t-1} u(-t)$$

$$h(\lambda) = 2e^{\lambda-1} u(-\lambda)$$

$$y(t) = \int_{-\infty}^{+\infty} h(\lambda) h(t-\lambda) d\lambda$$

$$= \int_{-\infty}^{+\infty} 2e^{\lambda-1} u(-\lambda) \times e^{t-\lambda+1} (u(t-\lambda) - u(t-\lambda-d))$$

$$= \int_{-\infty}^{+\infty} 2e^{\lambda-1} u(-\lambda) \times (e^{t-\lambda+1} u(t-\lambda) - e^{t-\lambda+1} u(t-\lambda-d))$$

$$= \int_{-\infty}^{+\infty} 2e^{\lambda-1} u(-\lambda) \cdot e^{t-\lambda+1} \cdot u(t-\lambda) - \int_{-\infty}^{+\infty} 2e^{\lambda-1} u(-\lambda) \cdot e^{t-\lambda+1} \cdot u(t-\lambda-d)$$

$$2 \int_{-\infty}^{+\infty} e^{\lambda-1+t-\lambda+1} \cdot u(-\lambda) \cdot u(t-\lambda) - 2 \int_{-\infty}^{+\infty} e^{\lambda-1+t-\lambda+1} \cdot u(-\lambda) \cdot u(t-\lambda-d)$$

$$2e^t \int_0^t 1 d\lambda - 2e^t \int_0^{t-d} 1 d\lambda \Rightarrow 2e^t \times \lambda \Big|_0^t - 2e^t \lambda \Big|_0^{t-d}$$

$$2e^t (t-0) - 2e^t (t-d-0) \rightarrow 2e^t t - 2e^t (t-d)$$

$$\rightarrow 2e^t t u(-t) - 2e^t (t-d) u(t-d)$$



The image shows the MATLAB R2017a Editor window. The top toolbar includes menus for PLOTS, APPS, EDITOR, PUBLISH, and VIEW. The Editor window displays a script named 'Untitled2.m' with the following code:

```
1 - H(n) = (1/2)^n * u(n); x(n) = u(n) - 2*n*(n-2) + u(n-6);  
2 - h: (n >= 0 & n < 1);  
3 - x = (u(n) .* (n >= 0 & n < 0) + (-2*n) .* (n >= 2 & n < 2) + (u(n-6) .* (n >= 6 & n < 6)));  
4 - conv(x, h);
```

Below the code, the Command Window displays an error message:

```
Undefined function or variable 'n'.  
  
Error in Untitled2 (line 1)  
H(n) = (1/2)^n * u(n); X(n) = u(n) - 2*n*(n-2) + u(n-6);
```

At the bottom of the Command Window, the prompt 'fx >>' is visible.

Overlaid on the center of the image is the Persian text: انشالله تمرین های آینده بهتر از این باشه!