

QUIZ 1

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Download all python codes from

<https://github.com/AmulyaTallamraju/EE3900/blob/main/QUIZ1/codes/QUIZ1.ipynb>

and latex-tikz codes from

<https://github.com/AmulyaTallamraju/EE3900/blob/main/QUIZ1/QUIZ1.tex>

1 2.22(c)

Use discrete convolution to find the response to the input $x[n]$ of the linear-time invariant system with impulse response $h[n]$

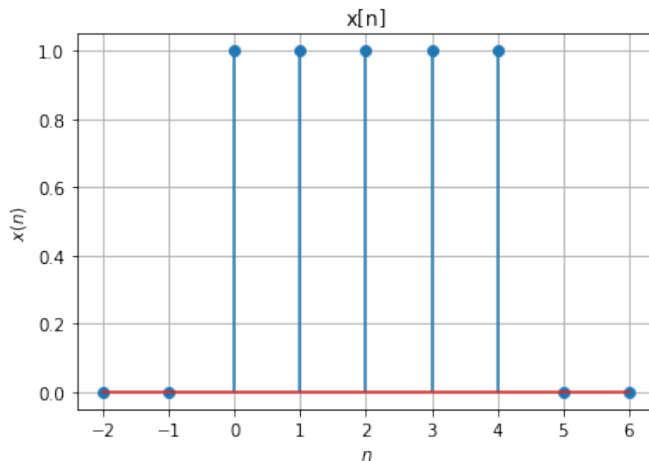


Fig. 0: Plot of $x[n]$

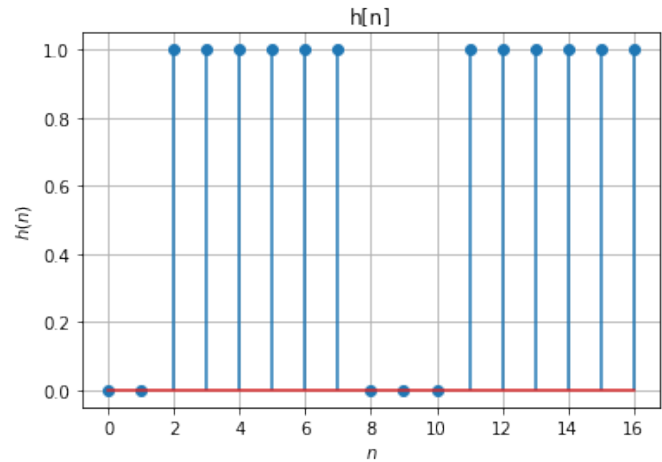


Fig. 0: Plot of $h[n]$

Using discrete time convolution

$$y[n] = x[n] * h[n] \quad (2.0.3)$$

$$= \sum_{m=-\infty}^{\infty} x[m]h[n-m] \quad (2.0.4)$$

$$= \sum_{m=0}^4 h[n-m] \quad (2.0.5)$$

$$y[n] = \sum_{m=0}^4 (u[n-2-m] + u[n-11-m] - (u[n-8-m] + u[n-17-m])) \quad (2.0.6)$$

The above expression has been computed using python.

2 SOLUTION

$$x[n] = u[n] - u[n-5] \quad (2.0.1)$$

$$h[n] = u[n-2] - u[n-8] + u[n-11] + u[n-17] \quad (2.0.2)$$

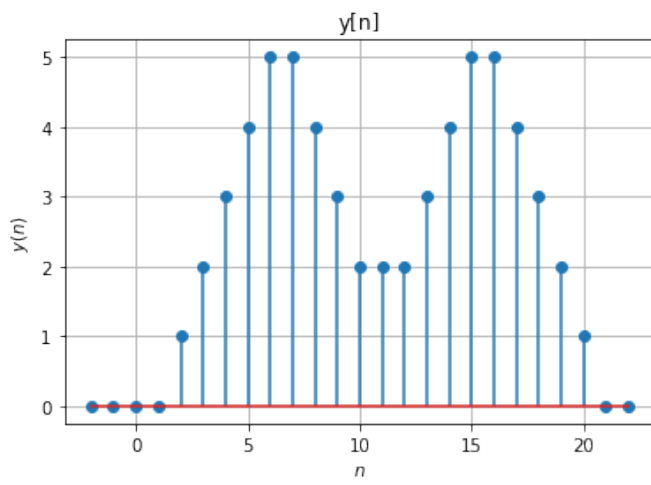


Fig. 0: Plot of $y[n]$