## Problem 6.10

(a) Plot of signal $x[n]=3 \delta[n]-2 \delta[n-2]+\delta[n-3]$

(b) When input is $x[n]$, find output $y[n]$ in accordance to the table given in question:
$y[n]=3\{\delta[n]-\delta[n-3]\}-2\{\delta[n-2]-\delta[n-5]\}+\{\delta[n-$ $3]-\delta[n-6]\}$
$=3 \delta[n]-2 \delta[n-2]-2 \delta[n-3]+2 \delta[n-5]-\delta[n-6]$

Plot:

(c) Output when input is $y[n]=\cos (\pi(n-3) / 3)$
$y[n]=2 \cos (\pi(n-3) / 3)$
(d) The impulse response of the system is:
$h[n]=\delta[n]-\delta[n-3]$
Hence, $H\left(e^{j \hat{\omega}}\right)=1-e^{-j 3 \hat{\omega}}$.
Thus, $H\left(e^{j \frac{\pi}{2}}\right)$ is not equal to 0 . The Statement is False.

