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:

$$y[n] = 3\{\delta[n] - \delta[n-3]\} - 2\{\delta[n-2] - \delta[n-5]\} + \{\delta[n-3] - \delta[n-6]\}$$

= $3\delta[n] - 2\delta[n-2] - 2\delta[n-3] + 2\delta[n-5] - \delta[n-6]$





(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, $H(e^{j\hat{\omega}}) = 1 - e^{-j3\hat{\omega}}$. Thus, $H(e^{j\frac{\pi}{2}})$ is not equal to 0. The Statement is False.