Homework Score	/ 4
Quiz Score	/ 4
Total	/ 8

1. Consider the discrete-time signal

$$x[n] = 5 + \cos\left(\frac{\pi}{2}n\right)$$

which is the input to an LTI system having impulse response

$$h[n] = \{1, \underline{0}, 1\}$$

(a) Make an accurate plot of $X(e^{j\Omega})$ over the range $-\pi \leq \Omega < \pi$. You must accurately label the frequency axis as well as amplitudes and/or impulse function areas.



(b) Find an equation for $H(e^{j\Omega})$. Simplify your answer to so that it is expressed in terms of real-valued cosine and/or sine functions.



(c) Make an accurate plot of $|H(e^{j\Omega})|$ over the range $-\pi \leq \Omega < \pi$. You must accurately label the frequency axis as well as amplitudes and/or impulse function areas.



(d) Let the system output be y[n]. Make an accurate plot of $Y(e^{j\Omega})$ over the range $-\pi \leq \Omega < \pi$.

