PROBLEM:

Circle the correct answer to each of these short answer questions:

1. If the frequency response of a system is $H(e^{j\hat{\omega}}) = 1$, then the impulse response is:

   (a) $h[n] = 1$

   (b) $h[n] = 0$

   (c) $h[n] = \delta[n]$

   (d) $h[n] = \delta[n-1]$

   (e) none of the above

2. Pick the correct frequency response for the FIR filter: $y[n] = x[n-1] + x[n-3]$

   (a) $2\cos(\hat{\omega})$

   (b) $2e^{-j1.5\hat{\omega}}\cos(1.5\hat{\omega})$

   (c) $2e^{-j1.5\hat{\omega}}\cos(\hat{\omega})$

   (d) $2e^{-j2\hat{\omega}}\cos(\hat{\omega})$

   (e) none of the above

3. Recall the deconvolution exercise from lab. Suppose that $H_1(e^{j\hat{\omega}})$ and $H_2(e^{j\hat{\omega}})$ are two filters in cascade and that the filter $H_2(e^{j\hat{\omega}})$ is supposed to "deconvolve" the effect of $H_1(e^{j\hat{\omega}})$. The deconvolution will be done perfectly if $H_2(e^{j\hat{\omega}})$ satisfies:

   (a) $H_2(e^{j\hat{\omega}}) = 1$

   (b) $H_2(e^{j\hat{\omega}}) = -H_1(e^{j\hat{\omega}})$

   (c) $H_2(e^{j\hat{\omega}}) = H_1^*(e^{j\hat{\omega}})$

   (d) $H_2(e^{j\hat{\omega}}) = 1/H_1(e^{j\hat{\omega}})$

   (e) $H_2(e^{j\hat{\omega}}) = e^{-j\hat{\omega}}$

4. If $H(z) = \dfrac{1+z^{-1}}{1+\frac{1}{2}z^{-1}}$, the value of the frequency response at $\hat{\omega} = 0.98\pi$ is equal to

   (a) zero

   (b) $0.125e^{-j0.47\pi}$

   (c) $0.125e^{j0.47\pi}$

   (d) $8e^{j0.47\pi}$

   (e) $1.99e^{j0.02\pi}$