PROBLEM:

For each of the systems defined on the left, find the corresponding frequency response on the right. Pick the correct frequency response and enter the number in the answer box:

Impulse Response or Difference Equation

(a) $h[n] = \delta[n] - (\frac{1}{2})^n u[n-1]$

ANS =

(b) $h[n] = \delta[n] + \delta[n-2]$

ANS =

(c) $y[n] = \frac{1}{2}y[n-1] + x[n]$

ANS =

(d) $h[n] = (-\frac{1}{2})^n u[n]$

ANS =

(e) $y[n] = \Big((-\frac{1}{2})^n u[n]\Big) * \Big(\delta[n] + \delta[n-1]\Big)$

ANS =

Frequency Response

1. $H(e^{j\hat{\omega}}) = 2e^{-j\hat{\omega}}\cos(\hat{\omega})$
2. $H(e^{j\hat{\omega}}) = 1 + e^{-j\hat{\omega}}$
3. $H(e^{j\hat{\omega}}) = \dfrac{1}{1 + \frac{1}{2}e^{-j\hat{\omega}}}$
4. $H(e^{j\hat{\omega}}) = \dfrac{1 + e^{-j\hat{\omega}}}{1 + \frac{1}{2}e^{-j\hat{\omega}}}$
5. $H(e^{j\hat{\omega}}) = 1 + \frac{1}{2}e^{-j\hat{\omega}}$
6. $H(e^{j\hat{\omega}}) = \dfrac{1 - e^{-j\hat{\omega}}}{1 - \frac{1}{2}e^{-j\hat{\omega}}}$
7. $H(e^{j\hat{\omega}}) = \dfrac{1}{1 - \frac{1}{2}e^{-j\hat{\omega}}}$
8. $H(e^{j\hat{\omega}}) = \dfrac{1 + \frac{1}{2}e^{-j\hat{\omega}}}{1 + e^{-j\hat{\omega}}}$