

PROBLEM:

Pick the correct output signal and enter the number in the answer box:

Difference Equation, $H(z)$, $H(e^{j\hat{\omega}})$, or $h[n]$.

Output Signal

(a)
$$H(z) = \frac{100z^{-1} - 100}{1 - \frac{1}{3}z^{-1}}$$

with $x[n] = u[n]$

ANS =

(b)
$$y[n] = \frac{1}{3}y[n-1] + 100x[n]$$

with $x[n] = \cos(0.25\pi n)$

ANS =

1. $y[n] = 125 \cos(0.25\pi n - 0.3)$

2. $y[n] = 100\left(\frac{1}{3}\right)^{n-1}u[n-1]$

3. $y[n] = 100\delta[n-1] - 100\delta[n]$

4. $y[n] = -100\left(\frac{1}{3}\right)^n u[n]$

5. $y[n] = 100\left(-\frac{1}{3}\right)^n u[n]$

6. $y[n] = 125 \cos(0.25\pi n + 0.3)$