$h[n] = \left(\frac{1}{3}\right)^n u[n] \rightarrow u[n] \begin{cases} 1, & n \geq 0 \\ 0, & n < 0 \end{cases}$

$x[n] = \cos\left(\frac{\pi}{50}n\right) + 0{,}2\cos\left(\frac{\pi}{10}n\right)$

Sabendo que $\sum_{k=-\infty}^{+\infty} h[k] \cdot A e^{j\omega_0(n-k)} = H(e^{j\omega_0}) \cdot A e^{j\omega_0 n}$

então buscando $H(e^{j\omega_0})$ de $\left(\frac{1}{3}\right)^n u[n]$ temos:

$H(e^{j\omega_0}) = \sum_{n=-\infty}^{+\infty} \left(\frac{1}{3}\right)^n u[n] e^{-j\omega_0 n} = \sum_{n=0}^{+\infty} \left(\frac{1}{3}\right)^n e^{-j\omega_0 n}$

$H(e^{j\omega_0}) = \sum_{n=0}^{+\infty} \left(\frac{1}{3} \cdot e^{-j\omega_0}\right)^n$

$H(e^{j\omega_0}) = \frac{1}{1 - \frac{1}{3}e^{-j\omega_0}}$

Queremos $y[n] = h[n] * x[n]$ então pela soma de somatórios

$y[n] = H(e^{j\frac{\pi}{50}}) \cdot \cos\left(\frac{\pi}{50}n\right) + H(e^{j\frac{\pi}{10}}) \cdot 0{,}2\cos\left(\frac{\pi}{10}n\right)$

$y[n] = \frac{\cos\left(\frac{\pi}{50}n\right)}{1 - \frac{1}{3}e^{-j\frac{\pi}{50}}} + \frac{1}{5} \cdot \frac{\cos\left(\frac{\pi}{10}n\right)}{1 - \frac{1}{3}e^{-j\frac{\pi}{10}}}$