PROBLEM:
Answer the following questions about the time-domain response of FIR digital filters:

\[ y[n] = \sum_{k=0}^{M} b_k \cdot x[n - k] \]

(a) When tested with an input signal that is an impulse, \( x[n] = \delta[n] \), the observed output from the filter is the signal \( h[n] \) shown below:

\[ \delta[n] = \begin{cases} 1 & \text{for } n = 0 \\ 0 & \text{for } n \neq 0 \end{cases} \]

Determine the filter coefficients \( \{b_k\} \) of the difference equation for the FIR filter.

(b) If the filter coefficients are \( \{b_k\} = \{13, -13, 13\} \) and the input signal is

\[ x[n] = \begin{cases} 0 & \text{for } n \text{ even} \\ 1 & \text{for } n \text{ odd} \end{cases} \]

determine the output signal \( y[n] \) for all \( n \). Give your answer as either a plot or a formula.