GATE: IN/28

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QUESTION: Consider the discrete time signal $x[n] = u[-n+5] - u[n+3]$, where

$$u[n] = \begin{cases} 1; n \geq 0 \\ 0; n < 0 \end{cases}$$

The smallest n for which $x[n] = 0$ is?

Solution: From Fig. 3, the range of n can be given as

$$n \in [-3, 5] \tag{1}$$

So, the minimum value of n is given as

$$n = -3 \tag{2}$$

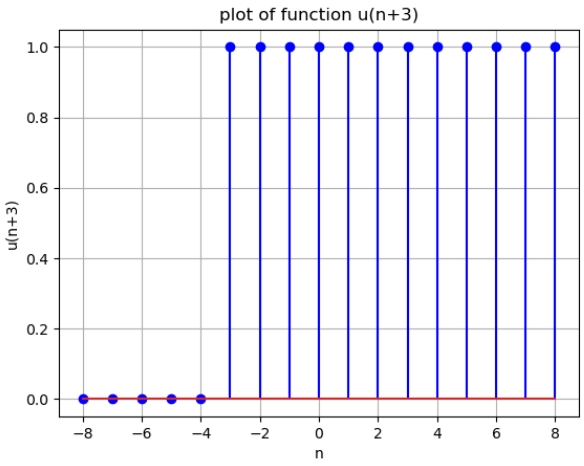

Fig. 1. Plot of function u($n+3$) taken from python3

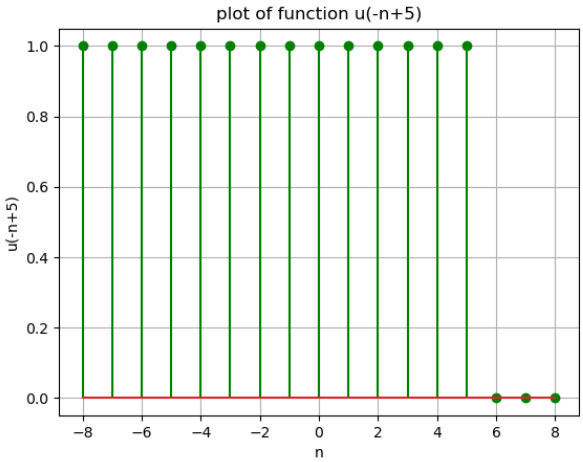

Fig. 2. Plot of function u($-n+5$) taken from python3

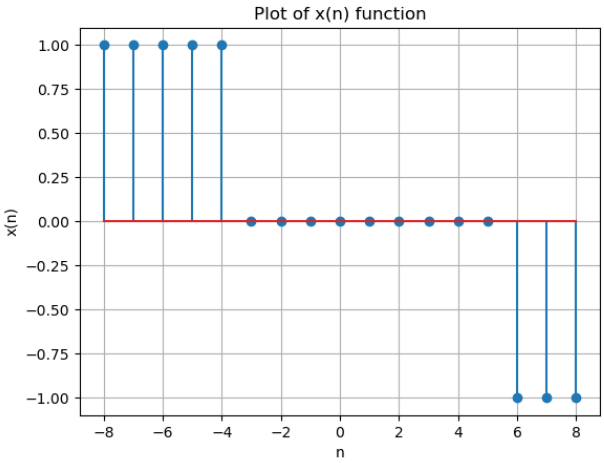

Fig. 3. Plot of function x(n) taken from python3