

Assignment-2

EE1205 : Signals and Systems
Indian Institute of Technology Hyderabad

Chirag Garg
(EE23BTECH11206)

I. QUESTION 11.9.1 (5)

Write the first five terms of the sequence whose n^{th} term is : $x(n) = (-1)^{n-1} 5^{n+1}$.

II. SOLUTION

Parameter	Value	Description
$x(n)$	$(-1)^n 5^{n+2}$	General Term
$x(0)$	25	First term of G.P.
r	-5	Common ratio of G.P.
$X(z)$	-	Z-Transform

TABLE I
GIVEN PARAMETERS

$$x(n) = (-1)^n \cdot 5^{n+2} \cdot u(n) \quad (1)$$

$$= 25 \cdot (-5)^n \cdot u(n) \quad (2)$$

On substituting $n = 0, 1, 2, 3$ and 4 , we get the first five terms.

Hence, the required terms are 25, -125, 625, -3125, 15625.

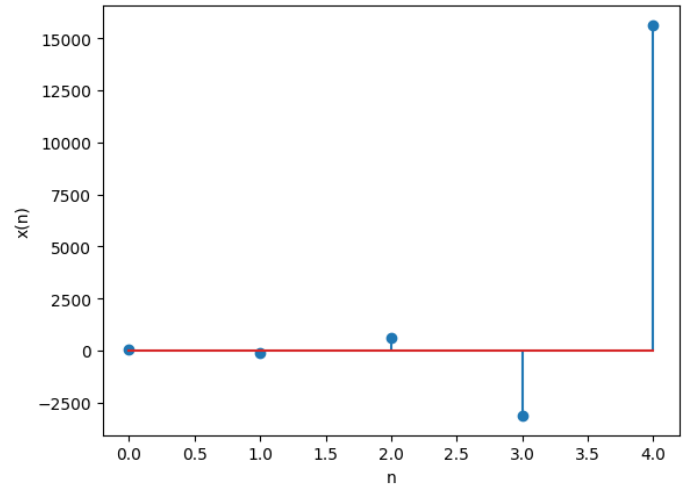


Figure 1

$$x(n) \longleftrightarrow X(z)$$

$$a^n \cdot u(n) \leftrightarrow \frac{1}{1 - a \cdot z^{-1}} ; |z| > |a| \quad (3)$$

$$\therefore X(z) = \frac{25}{1 + 5 \cdot z^{-1}} ; (|z| > 5) \quad (4)$$