

NCERT DISCRETE

EE23BTECH11020 - Raghava Ganji*

Question 10.5.3.5: The first term of an AP is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.

solution:

Given AP is 5, ..., 45.

$x(0)$	5	1st term
$x(n-1)$	45	nth term
$s(n-1)$	400	sum of n terms
n	?	no.of terms
d	?	common difference

TABLE 0
PARAMETERS

$$x(n) = x(0) + nd \quad (1)$$

$$40 = (n-1)d \quad (2)$$

$$s(n) = \frac{n+1}{2} [2x(0) + nd] \quad (3)$$

$$s(n-1) = \frac{n}{2} [2x(0) + (n-1)d] \quad (4)$$

$$\rightarrow n = 16 \quad (5)$$

$$\rightarrow d = \frac{8}{3} \quad (6)$$

by substituting the value of n in the equation 2, we get the equation 6.

z transform of $x(n)$, $s(n)$ are $X(z)$, $S(z)$

$$\rightarrow X(z) = \frac{7}{3(1-z^{-1})} + \frac{8}{3(1-z^{-1})^2} \quad (7)$$

$$\rightarrow S(z) = \frac{7}{3(1-z^{-1})^2} + \frac{8}{3(1-z^{-1})^3} \quad (8)$$

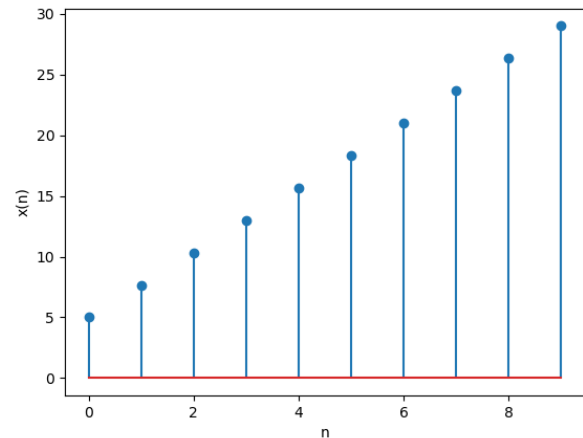


Fig. 0. figure:1