EE23BTECH11208 - Manohar K*

EXERCISE 9.2

14. Insert five numbers between 8 and 26 such that the resulting sequence is an A.P. and obtain the Z-transform of the sequence.

Solution: Given,

symbol	value	description
$x(0)$	8	first term of the series
$x(6)$	26	last term of the series
N	$2+5=7$	number terms in the series

TABLE I
PARAMETERS

$$d = \frac{x(6) - x(0)}{N-1}, \tag{1}$$

$$= 3 \tag{2}$$

$$x(n) = u(n)\left(x(0) + (n)(d)\right) \tag{3}$$

the A.P. sequence is:

$$8, 11, 14, 17, 20, 23, 26$$

using eq (**??**),

$$\implies X(z) = \frac{8}{1-z^{-1}} + \frac{3z^{-1}}{(1-z^{-1})^2} \quad \{z \in \mathbb{C} : z \neq 1\}$$

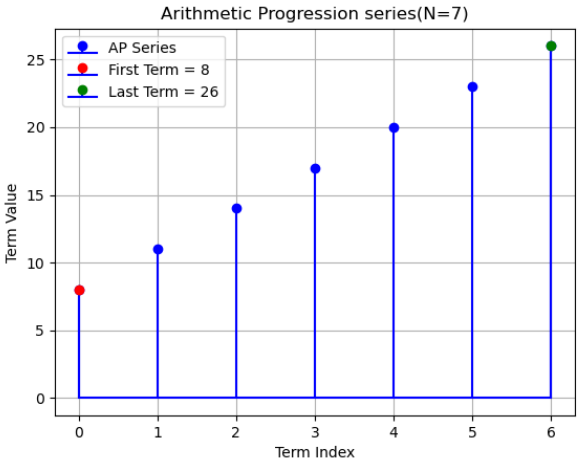

Fig. 1. Plot of x(n) vs n