Exercise 9.1   Page No: 9.5

1. Write the first terms of each of the following sequences whose n^{th} term are:
(i) $a_n = 3n + 2$
(ii) $a_n = (n – 2)/3$
(iii) $a_n = 3^n$
(iv) $a_n = (3n – 2)/5$
(v) $a_n = (-1)^n \cdot 2^n$
(vi) $a_n = n(n – 2)/2$
(vii) $a_n = n^2 - n + 1$
(viii) $a_n = n^2 - n + 1$
(ix) $a_n = (2n – 3)/6$

Solutions:
(i) $a_n = 3n + 2$
            Given sequence whose $a_n = 3n + 2$
            To get the first five terms of given sequence, put n = 1, 2, 3, 4, 5 and we get
            $a_1 = (3 \times 1) + 2 = 3 + 2 = 5$
            $a_2 = (3 \times 2) + 2 = 6 + 2 = 8$
            $a_3 = (3 \times 3) + 2 = 9 + 2 = 11$
            $a_4 = (3 \times 4) + 2 = 12 + 2 = 14$
            $a_5 = (3 \times 5) + 2 = 15 + 2 = 17$
            ∴ the required first five terms of the sequence whose n^{th} term, $a_n = 3n + 2$ are 5, 8, 11, 14, 17.

(ii) $a_n = (n – 2)/3$

            Given sequence whose $a_n = \dfrac{n - 2}{3}$
            On putting n = 1, 2, 3, 4, 5 then can get the first five terms
            $a_1 = \dfrac{1 - 2}{3} = \dfrac{-1}{3} ; a_2 = \dfrac{2 - 2}{3} = 0$

            $a_3 = \dfrac{3 - 2}{3} = \dfrac{1}{3} ; a_4 = \dfrac{4 - 2}{3} = \dfrac{2}{3}$

            $a_5 = \dfrac{5 - 2}{3} = 1$

            ∴ the required first five terms of the sequence whose n^{th} term, $a_n = \dfrac{n - 2}{3}$ are $\dfrac{-1}{3}, 0, \dfrac{1}{3}, \dfrac{2}{3}, 1.$

(iii) $a_n = 3^n$
            Given sequence whose $a_n = 3^n$
            To get the first five terms of given sequence, put n = 1, 2, 3, 4, 5 in the above
            $a_1 = 3^1 = 3;$
            $a_2 = 3^2 = 9;$
            $a_3 = 27;$
            $a_4 = 3^4 = 81;$

$a_5 = 3^5 = 243$.

∴ the required first five terms of the sequence whose n^{th} term, $a_n = 3^n$ are 3, 9, 27, 81, 243.

(iv) $a_n = (3n - 2)/5$

Given sequence whose $a_n = \dfrac{3n - 2}{5}$

To get the first five terms of the sequence, put n = 1, 2, 3, 4, 5 in the above
And, we get

$a_1 = \dfrac{3 \times 1 - 2}{5} = \dfrac{3 - 2}{5} = \dfrac{1}{5}$

$a_2 = \dfrac{3 \times 2 - 2}{5} = \dfrac{6 - 2}{5} = \dfrac{4}{5}$

$a_3 = \dfrac{3 \times 3 - 2}{5} = \dfrac{9 - 2}{5} = \dfrac{7}{5}$

$a_4 = \dfrac{3 \times 4 - 2}{5} = \dfrac{12 - 2}{5} = \dfrac{10}{5}$

$a_5 = \dfrac{3 \times 5 - 2}{5} = \dfrac{15 - 2}{5} = \dfrac{13}{5}$

∴ the required first five terms of the sequence are 1/5, 4/5, 7/5, 10/5, 13/5

(v) $a_n = (-1)^n 2^n$

Given sequence whose $a_n = (-1)^n 2^n$
To get first five terms of the sequence, put n = 1, 2, 3, 4, 5 in the above.
$a_1 = (-1)^1.2^1 = (-1).2 = -2$
$a_2 = (-1)^2.2^2 = (-1).4 = 4$
$a_3 = (-1)^3.2^3 = (-1).8 = -8$
$a_4 = (-1)^4.2^4 = (-1).16 = 16$
$a_5 = (-1)^5.2^5 = (-1).32 = -32$
∴ the first five terms of the sequence are – 2, 4, - 8, 16, - 32.

(vi) $a_n = n(n – 2)/2$

The given sequence is, $a_n = \dfrac{n(n - 2)}{2}$

To get the first five terms of the sequence, put n = 1, 2, 3, 4, 5.
And, we get

$$a_1 = \frac{1(1-2)}{2} = \frac{1-1}{2} = \frac{-1}{2}$$

$$a_2 = \frac{2(2-2)}{2} = \frac{2.0}{2} = 0$$

$$a_3 = \frac{3(3-2)}{2} = \frac{3.1}{2} = \frac{3}{2}$$

$$a_4 = \frac{4(4-2)}{2} = \frac{4.2}{2} = 4$$

$$a_5 = \frac{5(5-2)}{2} = \frac{5.3}{2} = \frac{15}{2}$$

∴ the required first five terms are -1/2, 0, 3/2, 4, 15/2

(vii) $a_n = n^2 - n + 1$
The given sequence whose, $a_n = n^2 - n + 1$
To get the first five terms of given sequence, put n = 1, 2, 3, 4, 5.
And, we get
$a_1 = 1^2 - 1 + 1 = 1$
$a_2 = 2^2 - 2 + 1 = 3$
$a_3 = 3^2 - 3 + 1 = 7$
$a_4 = 4^2 - 4 + 1 = 13$
$a_5 = 5^2 - 5 + 1 = 21$
∴ the required first five terms of the sequence are 1, 3, 7, 13, 21.

(viii) $a_n = 2n^2 - 3n + 1$
The given sequence whose $a_n = 2n^2 - 3n + 1$
To get the first five terms of the sequence, put n = 1, 2, 3, 4, 5.
And, we get
$a_1 = 2.1^2 - 3.1 + 1 = 2 - 3 + 1 = 0$
$a_2 = 2.2^2 - 3.2 + 1 = 8 - 6 + 1 = 3$
$a_3 = 2.3^2 - 3.3 + 1 = 18 - 9 + 1 = 10$
$a_4 = 2.4^2 - 3.4 + 1 = 32 - 12 + 1 = 21$
$a_5 = 2.5^2 - 3.5 + 1 = 50 - 15 + 1 = 36$
∴ the required first five terms of the sequence are 0, 3, 10, 21, 36.

(ix) $a_n = (2n - 3)/6$

Given sequence whose, $a_n = \frac{2n - 3}{6}$
To get the first five terms of the sequence we put n = 1, 2, 3, 4, 5.
And, we get

$$a_1 = \frac{2.1 - 3}{6} = \frac{2 - 3}{6} = \frac{-1}{6}$$

$$a_2 = \frac{2.2 - 3}{6} = \frac{4 - 3}{6} = \frac{1}{6}$$

$$a_3 = \frac{2.3 - 3}{6} = \frac{6 - 3}{6} = \frac{3}{6} = 1/2$$

$$a_4 = \frac{2.4 - 3}{6} = \frac{8 - 3}{6} = \frac{5}{6}$$

$$a_5 = \frac{2.5 - 3}{6} = \frac{10 - 3}{6} = \frac{7}{6}$$

∴ the required first five terms of the sequence are -1/6, 1/6, 1/2, 5/6 and 7/6