



Exercise 11D

Question 11:

The given AP is 25, 20, 15, ...

\therefore first term $a = 25$, common difference $= 20 - 25 = -5$

Let for lowest value of n , n^{th} term is negative

$$a + (n - 1)d < 0$$

$$\text{or } 25 + (n - 1)(-5) < 0$$

$$\Rightarrow 5(n - 1) > 25$$

$$\Rightarrow 5n > 25 + 5 = 30$$

$$\Rightarrow n > 6$$

So, the first negative term is the 7th term

Question 12:

The given AP is 5, 7, 9, ... 201

last term $l = 201$, common difference $d = 7 - 5 = 2$

6th term from the end $= l - (n - 1)d$

$$= 201 - (6 - 1) \times 2$$

$$= 201 - 10 = 191$$

Question 13:

Sum of n natural numbers $= 1 + 2 + 3 + \dots + n$

Here $a = 1$, $d = 2 - 1 = 1$

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

$$\therefore \text{Sum of natural numbers} = \frac{n}{2} [2 \times 1 + (n - 1)d]$$

$$= \frac{n}{2} [2 + (n - 1)] = \frac{n(n + 1)}{2}$$

Question 14:

Sum of even natural numbers $= 2 + 4 + 6 + \dots$ to n terms

$a = 2$, $d = 4 - 2 = 2$

$$S_n = \frac{n}{2} [2a + (n - 1)d]$$

\therefore Sum of even numbers

$$= \frac{n}{2} [2 \times 2 + (n - 1) \times 2]$$

$$= \frac{n}{2} [4 + 2n - 2]$$

$$= \frac{n}{2} (2n + 2)$$

$$= \frac{2n(n + 1)}{2}$$

$$= n(n + 1)$$

Question 15:

Sum of n odd natural numbers = $1 + 3 + 5 + \dots$ to n terms
 $a = 1, d = 3 - 1 = 2$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

\therefore Sum of n odd numbers

$$= \frac{n}{2} [2 \times 1 + (n-1) \times 2] = [2 + 2n - 2]$$

$$= \frac{n}{2} \times 2n = n^2$$

***** END *****