

UDAAN 2025

Maths

Arithmetic Progressions

DHA : 03

- ✓Q1 The sum of first 16 terms of the A.P. 10, 6, 2, is
✓(A) -320 (B) 315
✓(C) -352 (D) -400
- ✓Q2 Find the sum of first five multiples of 3.
✓(A) 45 (B) 48
(C) 23 (D) 75
- ✓Q3 In an A.P. if $a = 1$, $a_n = 20$ and $S_n = 399$, then find the value of ' n '.
(A) 28 (B) 10
✓(C) 38 (D) 42
- ✓Q4 In an A.P., if first term and third term are 5 and 15 respectively, then find the sum of first 16 terms of an A.P.
(A) 600 ✓(B) 680
(C) 585 (D) 860
- ✓Q5 Find the number of terms of the A.P. 17, 15, 13, 11, which are required to be added to get the sum 72 .
✓(A) 6 terms (B) 4 terms
(C) 8 terms (D) 15 terms
- ✓Q6 The sum of first ' n ' odd natural numbers is
✓(A) n^2 (B) $n + 1$
(C) $2n + 1$ (D) n
- ✓Q7 In an A.P., the first term is 22 and n^{th} terms is -11 . If the sum to first ' n ' terms is 66 . Then the value of ' n ' is
(A) 10 ✓(B) 12
(C) 14 (D) 16
- ✓Q8 Find the sum of 5,13,21.....181
(A) 2476 (B) 2337
(C) 2219 ✓(D) 2139



Answer Key

Q1 (A)

Q2 (A)

Q3 (C)

Q4 (B)

Q5 (A)

Q6 (A)

Q7 (B)

Q8 (D)



Hints & Solutions

Q1 Text Solution:

Given AP is 10, 6, 2, ...

Here, the first term, $a = 10$.

Common difference, $d = 6 - 10 = -4$

$$\therefore S_{16} = 16/2 [2a + (16-1)d] [\because S_n = n/2 \{2a + (n-1)d\}]$$

$$= 8[2 \times 10 + 15(-4)]$$

$$= 8(20 - 60)$$

$$= 8(-40)$$

$$= -320$$

Video Solution:



Q2 Text Solution:

First term, $a = 3$,

$d = 6 - 3 = 3$ and

number of terms, $n = 5$

The formula to find the sum is

$$S_n = n/2 [2a + (n-1)d]$$

Substituting the values

$$S_5 = 5/2 [2a + (5-1)d]$$

$$S_5 = 5/2 [2 \times 3 + 4 \times 3]$$

So we get

$$S_5 = 5/2 (6 + 12)$$

$$S_5 = 5 \times 9$$

$$S_5 = 45.$$

Therefore, $S_5 = 45$.

Video Solution:



Q3 Text Solution:

$a = 1$

$$a_n = 20$$

$$S_n = 399.$$

The formula to find the sum is

$$S_n = n/2 [a + a_n]d.$$

Substituting the values, we get,

$$399 = n/2 [1 + 20].$$

$$798 = nx 21 \text{ -----(1)}$$

$$n = 798/21.$$

Therefore, $n = 798/21 = 38$

Video Solution:



Q4 Text Solution:

$$a = 5 \rightarrow (1)$$

$$a + 2d = 15 \rightarrow (2)$$

$$5 + 2d = 15$$

$$2d = 10$$

$$d = 5$$

$$S_{16} = 16/2 ((2 \times 5) + (15 \times 5))$$

$$= 8(10 + 75)$$

$$= 8 \times 85$$

$$= 680$$

Video Solution:



Q5 Text Solution:

Here $a = 17$ & $d = -2$

$$S_n = 72$$

$$S_n = n/2 [2a + (n-1)d]$$



$$72 = n[2(17) + (n-1)(-2)]$$

$$72 = n[17 + (n-1)(-1)]$$

$$72 = n[17 - n + 1]$$

$$72 = n(18 - n)$$

$$72 = 18n - n^2$$

$$n^2 - 18n + 72 = 0$$

$$n^2 - 12n - 6n + 72 = 0$$

$$n(n-12) - 6(n-12) = 0$$

$$(n-12)(n-6) = 0$$

$$n = 12 \text{ or } n = 6$$

so the series will be

17, 15, 13, 11, 9, 7, 5, 3, 1, -1, -3, -5 or

17, 15, 13, 11, 9, 7

Hence According to the options 6 terms are required to be added to get the sum 72

Video Solution:



Q6 Text Solution:

1 + 3 + 5 + ... up to n terms

$$\therefore S_n = n/2 [2 \times 1 + (n-1) \times 2] [\because S_n = n/2 [2a + (n-1)d]]$$

$$= n/2 [2 + 2n - 2]$$

$$= n/2 \times 2n$$

$$= n^2$$

$\therefore 1 + 3 + 5 + \dots$ up to n terms $= n^2$

Hence, sum of first n odd natural numbers is n^2 .

Video Solution:



Q7 Text Solution:

$$S_n = n/2 [a + a_n]$$

$$a = 22$$

$$a_n = -11$$

$$66 = n/2 [22 - 11]$$

$$132 = n[11]$$

$$n = 12$$

Video Solution:



Q8 Text Solution:

$$a = 5$$

$$d = a_2 - a_1$$

$$= 13 - 5$$

$$= 8$$

$$a_n = l = 181$$

$$a_n = a + (n-1)d$$

$$181 = 5 + (n-1) \times 8$$

$$181 - 5 = (n-1) \times 8$$

$$176 = (n-1) \times 8$$

$$176/8 = (n-1)$$

$$22 = n - 1$$

$$n = 23$$

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

$$S_{23} = \frac{23}{2} [10 + (23-1) \times 8]$$

$$= \frac{23}{2} [10 + 22 \times 8]$$

$$= \frac{23}{2} [10 + 176]$$

$$= \frac{23}{2} [186]$$

$$= 2139$$

Video Solution:

