UDAAN 2025

Maths

Arithmetic Progressions

DHA: 02

Q1 Which term of the A.P. $72, 63, 54, \ldots\ldots\ldots$ is 0 ?

(A) 8^{th}
(B) 9^{th}
(C) 10^{th}
(D) 11^{th}

Q2 Which term of the A.P. $25, 20, 15, \ldots$ is the first negative term?

(A) 10^{th}
(B) 9^{th}
(C) 8^{th}
(D) 7^{th}

Q3 Which term of the A.P. $21, 42, 63, 84, \ldots$ is 210 ?

(A) 9^{th}
(B) 10^{th}
(C) 11^{th}
(D) 12^{th}

Q4 What is 20^{th} term from the end of the A.P. $3, 8, 13, \ldots\ldots$ 253?

(A) 163 (B) 158
(C) 153 (D) 148

Q5 If a_n denotes the n^{th} term of the A.P. $3, 8, 13, 18, \ldots\ldots$, then what is the value of $(a_{30} - a_{20})$?

(A) 40 (B) 36
(C) 50 (D) 56

Q6 If p^{th} and q^{th} term of an A.P. are q and p respectively, then find the r^{th} term of A.P.

(A) $p + q$ (B) $p - q + r$
(C) $p + q + r$ (D) $p + q - r$

Answer Key

Q1	(B)	Q4	(B)
Q2	(D)	Q5	(C)
Q3	(B)	Q6	(D)

Hints & Solutions

Q1 Text Solution:

Given the series as 72,63,54....

a=72 and d=63–72=–9

Let an=0

a+(n–1)d=0

⇒72–9(n–1)=0

⇒-72=-9(n-1)

⇒–n-1=8

n=9

Video Solution:

Q2 Text Solution:

a=25

d=20–25=–5

a_n<0

a+(n–1)d<0

25+(n–1)(–5)<0

25<5(n–1)

5<(n–1)

n>6

⇒n=7

7th term is negative.

a7=25+(7–1)(–5)

=25–5×6

=–5

Video Solution:

Q3 Text Solution:

Let the nth term of the given A.P be 210.

As per the question,

first term, a = 21

common difference, d = 42 - 21 = 21.

a_n = 210.

210 = 21 + (n - 1)21

189 = (n - 1)21

n - 1 = 9

n = 10

Therefore, the 10th term of an AP is 210.

Video Solution:

Q4 Text Solution:

We want to find 20th term from the last term of given AP. So, let's write given AP in this way:

253... 13, 8, 3

First term = a=253

Common Difference = d=8–13=–5

Using formula an=a+(n–1)d, to find nth term of arithmetic progression, we can say that

a_{20}=253+(20–1)(–5)

⇒ a_{20}=253+19(–5)

=253–95

=158

Therefore, the 20th term from the last term of given AP is 158.

Video Solution:

Q5 **Text Solution:**

Given AP is 3, 8, 13, 18, ……..

Therefore, first term of AP is a = 3

And common difference of AP is d = a2 – a1 = 8 – 3 = 5.

Given that an denotes the nth term of AP.

$a_{30} = 145$

$a_{20} = 95$

$Hence\ a_{30} - a_{20} = 50$

Video Solution:

Q6 **Text Solution:**

$a_p = a + (p-1)d$

$q = a + (p-1)d$

$a_q = a + (q-1)d$

$p = a + (q-1)d$

$On\ solving\ these\ equation\ by\ elimination\ method$

$d = -1$

$a = p + q - 1$

$hence\ a_r = a + (r-1)d$

$= p + q - 1 + (r-1) \times (-1)$

$= p + q - 1 - r + 1$

$= p + q - r$

Video Solution: