Exercise 11A

Question 11:

In the given AP, we have $a = \dfrac{5}{6}$; $d = \left(1 - \dfrac{5}{6}\right) = \dfrac{1}{6}$

Suppose there are n terms in given AP, we have
Then,

$T_n = 3 \Rightarrow a + (n-1)d = 3 \Rightarrow \dfrac{5}{6} + (n-1)\dfrac{1}{6} = 3$

$\Rightarrow \dfrac{5}{6} + \dfrac{1}{6}n - \dfrac{1}{6} = 3$

$\Rightarrow 4 + n = 18 \Rightarrow n = 14$

$\therefore \quad n = 14$

Thus, 14th term in the given AP is 3

Question 12:
We know that $T_1 - (5x + 2)$, $T_2 - (4x - 1)$ and $T_3 - (x + 2)$
Clearly,
$T_2 - T_1 = T_3 - T_2$
$\Rightarrow (4x - 1) - (5x + 2) = (x + 2) - (4x - 1)$
$\Rightarrow 4x - 1 - 5x - 2 = x + 2 - 4x + 1$
$\Rightarrow -x - 3 = -3x + 3$
$\Rightarrow -x + 3x = 6$
$\Rightarrow 2x = 6 \Rightarrow x = 3$
Hence x = 3

Question 13:
$T_n = (4n - 10)$
$\Rightarrow T_1 = (4 \times 1 - 10) = -6$ and $T_2 = (4 \times 2 - 10) = -2$
Thus, we have
(i) First term = -6
(ii) Common difference $= (T_2 - T_1) = (-2+6) = 4$

(iii) 16th term = a + (16-1) d, where a = -6 and d = 4
= (-6 + 15 × 4) = 54

Question 14:
In the given AP, let first term = a and common difference = d,
Then, $T_n = a + (n-1) d$
$\Rightarrow T_4 = a + (4 - 1)d$, $T_{10} = a + (10 - 1)d$
$\Rightarrow T_4 = a + 3d$, $T_{10} = a + 9d$
Now, $T_4 = 13 \Rightarrow a + 3d = 13$ - - - (1)
$T_{10} = 25 \Rightarrow a + 9d = 25$ - - - (2)
Subtracting (1) from (2), we get
$\Rightarrow 6d = 12 \Rightarrow d = 2$
Putting d = 2 in (1), we get
a + 3 × 2 = 13

$\Rightarrow a = (13 - 6) = 7$

Tthus, $a = 7$, and $d = 2$

17th term = $a + (17 - 1)d$, where $a = 7$, $d = 2$

$(7 + 16 \times 2) = (7 + 32) = 39$

$\therefore a = 7$, $d = 2$,

Question 15:

In the given AP, let first term = a and common difference = d

Then, $T_n = a + (n-1)d$

$\Rightarrow T_8 = a + (8 - 1)d$, $T_{12} = a + (12 - 1)d$

$\Rightarrow T_8 = a + 7d$, $T_{12} = a + 11d$

Now, $T_8 = 37 \Rightarrow a + 7d = 37$ - - - (1)

$T_{12} = 57 \Rightarrow a + 11d = 57$ - - - (2)

Subtracting (1) from (2), we get

$\Rightarrow 4d = 20 \Rightarrow d = 5$

Putting $d = 5$ in (1), we get

$a + 7 \times 5 = 37$

$\Rightarrow a = 2$

Tthus, $a = 2$, and $d = 5$

So the required AP is 2, 7, 12..

********** END **********