Exercise 11A

Question 11:

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

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

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

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

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

$$\therefore \ n = 14$$

Thus, 14^{th} 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 x 1 - 10) = -6 and T_2 = (4 x 2 - 10) = -2
Thus, we have
(i) First term = -6
(ii) Common difference = ($T_2 - T_1$) = (-2+6) = 4
(iii) 16^{th} term = a + (16-1) d, where a = -6 and d = 4
= (-6 + 15 x 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 x 2 = 13

⇒ a = (13 - 6) = 7
Tthus, a = 7, and d = 2
17^{th} term = a + (17 - 1)d, where a= 7, d = 2
(7 + 16 x 2) = (7 + 32) = 39
∴ 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
⇒ T_8 = a + (8 - 1)d, T_{12} = a + (12 - 1)d
⇒ T_8 = a + 7d, T_{12} = a + 11d
Now, T_8 = 37 ⇒ a + 7d = 37 - - - (1)
T_{12} = 57 ⇒ a + 11d = 57 - - - (2)
Subtracting (1) from (2), we get
⇒ 4d = 20 ⇒ d = 5
Putting d = 5 in (1), we get
a + 7 x 5 = 37
⇒ a = 2
Tthus, a = 2, and d = 5
So the required AP is 2, 7, 12..

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