Exercise 11C

Question 6:
Here, a = 15, d = (11 - 15) = -4, and l = - 13
Let the total number of term be n, then

$$T_n = -13$$
$$\Rightarrow a + (n-1)d = -13$$
$$\Rightarrow 15 + (n-1) \times (-4) = -13$$
$$\Rightarrow -4(n-1) = -28$$
$$(n-1) = 7 \Rightarrow n = 8$$

-13 is 8^{th} term.

$$\text{Required sum} = \frac{n}{2}(a+l)$$
$$= \frac{8}{2}(15-13) = 4(2) = 8$$

Hence, the sum of first 8^{th} term of given AP is 8.

Question 7:
All 2 - digit whole numbers, which are divisible by 3 are 12, 15, 18, 21, ... 99
This is an AP in which a = 12, d = (15 - 12) = 3, and l = 99
Let the number of these terms be n, then

$$T_n = 99 \Rightarrow a + (n-1)d = 99$$
$$\Rightarrow 12 + (n-1) \times 3 = 99$$
$$(n-1) \times 3 = 87 \Rightarrow n - 1 = 29$$
$$\Rightarrow n = 30$$

$$\text{Required sum} = \frac{n}{2}(a+l)$$
$$= \frac{30}{2}(12+99) = 15 \times 111 = 1665$$

Question 8:
All the even number between 5 and 100 are 6, 8, 10, 12, ..., 98
This is an AP in which a = 6, d = (8 - 6) = 2, l = 98

$$T_n = 98 \Rightarrow a + (n-1)d$$

$$\Rightarrow 6 + (n-1)2 = 98 \Rightarrow 2(n-1) = 92$$

$$\Rightarrow (n-1) = 46 \Rightarrow n = 47$$

$$\text{Required sum} = \frac{n}{2}(a+l)$$

$$= \frac{47}{2}(6+98) \Rightarrow 47 \times 52 = 2444$$

hence, $S_n = 2444$

Question 9:
All natural number divisible by 6 and less than 100 are 6, 12, 18, 24, ...96
This in AP in which a = 6, d = (12 - 6) = 6 and l = 96

$$T_n = 96$$

$$\Rightarrow a + (n-1)d = 96$$

$$\Rightarrow 6 + (n-1)6 = 96$$

$$\Rightarrow (n-1) \times 6 = 90$$

$$\Rightarrow n - 1 = 15$$

$$\Rightarrow n = 16$$

$$\text{Required sum} = \frac{n}{2}(a+l)$$

$$= \frac{16}{2}(6+96) = 8 \times 102 = 816$$

Hence, $S_n = 816$

Question 10:
All natural numbers between 100 and 500 divisible by 7 are 105, 112, 119, 126, ... 497
This is an AP in which a = 105, d = (112 - 105) = 7, l = 497
Let the number of term be n, then

$$T_n = a + (n-1)d = 497$$

$$\Rightarrow 105 + (n-1) \times 7 = 497 \Rightarrow 7(n-1) = 392 \Rightarrow n - 1 = 56$$

$$\Rightarrow \quad n = 57$$

$$\text{Required sum} = \frac{n}{2}(a+l) = \frac{57}{2}(105+497) = 57 \times 301$$

$$= 57 \times (300+1) = 57 \times 300 + 57 \times 1$$

$$= 17157$$

Hence, $S_n = 17157$

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