Exercise 11C

Question 11:
All numbers between 300 and 700 that are multiples of 9 are 306, 315, 324, 333, ..., 693
This is an AP in which a = 306, d = (315 - 306) = 9, l = 693
Let the number of these terms be n, then

$$T_n = 693$$
$$\Rightarrow a + (n-1)d = 693$$
$$\Rightarrow 306 + (n-1) \times 9 = 693$$
$$\Rightarrow 9(n-1) = 387$$
$$\Rightarrow (n-1) = 43$$
$$\Rightarrow n = 44$$

$$\text{Required sum} = \frac{n}{2}(a+l)$$
$$= \frac{44}{2}(306+693)$$
$$\Rightarrow 22 \times 999$$
$$\Rightarrow 22 \times (1000-1)$$
$$\Rightarrow 22 \times 1000 - 22$$
$$\Rightarrow 22000 - 22 = 21978$$
$$\text{Hence, } S_n = 21978$$

Question 12:
All three digit natural numbers divisible by 13 are 104, 117, 130, 143,..., 988
This is an AP in which a = 104, d = (117 - 104) = 13, l = 988

$T_n = 988 \Rightarrow a+(n-1)d = 988 \Rightarrow 104+(n-1)\times 13 = 988$

$\Rightarrow 13\times(n-1) = 884$

$\Rightarrow (n-1) = 68 \Rightarrow n = 69$

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

$= \frac{69}{2}(104+988) \Rightarrow 69\times 546$

$S_n = 37674$

Question 13:

First 15 multiples of 8 are 8, 16, 24, ... to 15th term

$\therefore a = 8,\ d = 16-8 = 8,\ n = 15$

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

Sum of first 15 multiples of 8

$$S_{15} = \frac{15}{2}[2\times 8+(15-1)\times 8] = \frac{15}{2}[16+112]$$

$$= \frac{15}{2}\times 128 = 15\times 64 = 960$$

Question 14:

Odd natural numbers between 0 and 50 are 1, 3, 5, ... 49

$\therefore$ a = 1, d = 3 - 1= 2, l = 49

Let the number of terms be n

Now, $l = a+(n-1)d$ or $49 = 1+(n-1)\times 2$

$49 = 1+2n-2 \quad \therefore 2n = 50$ or $n = 25$

Now, $S_n = \frac{n}{2}(a+l)$

Sum of odd numbers between 0 and 49

$$= \frac{25}{2}(1+49) = \frac{25}{2}\times 50 = 25\times 25 = 625$$

Question 15:

First 100 even natural numbers divisible by 5 are

10, 20, 30, ... to 100 term

First term of AP = 10

Common difference d = 20 - 10 = 10

Number of terms = n = 100

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

$$= \frac{100}{2}[2\times 10+(100-1)\times 10]$$

$$= 50(20+99\times 10)$$

$$= 50(20+990)$$

$$= 50\times 1010 = 50500$$

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