$S_n = n^2$

12. $\{6, 12, 18, 24, 30 \ldots 240\}$

$a = 6 \quad d = 6$

$S_{nn} = \frac{n}{2}\{2a + (n-1)d\}$

$S_{40} = \frac{40}{2}\{12 + 39 \times 6\}$

$S_{40} = 20\{12 + 234\}$

$S_{40} = 20\{246\}$

$S_{40} = 4920$

13. $\{8, 16, 24, 32 \ldots 90\}$

$a = 8 \quad d = 8$

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

$S_{15} = \frac{15}{2}\{16 + 14 \times 8\}$

$S_{15} = \frac{15}{2}\{16 + 112\}$

$S_{15} = \frac{15}{2}\{128\}$

$S_{15} = 15 \times 64$

$S_{15} = 960$

14. $\{1, 3, 5, 7, 9 \ldots 49\}$

$a = 1 \quad d = 2 \quad a_n = 49$

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

$S_{25} = \frac{25}{2}\{2 + 24 \times 2\}$

$S_{25} = \frac{25}{2}\{2 + 48\}$

$S_{25} = \frac{25}{2}\{50\}$

$S_{25} = 25 \times 25$

$S_{25} = 625$

$a_n = a + (n-1)d$

$49 = 1 + 2n - 2$

$49 = 2n - 1$

$50 = 2n$

$25 = n$

17. $3(1+2+3\ldots\ldots 12)$

$a=1 \quad d=1 \quad n=12$

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

$= 6\{2+11\}$

$= 6 \times 13$

$= 78 \times 3$

$= 234$

apsara

Date

15 $\{200, 250, 300 \cdots\}$

$a = 200 \quad d = 50 \quad n = 30$

$a_n = a + (n-1)d$

$a_{30} = 200 + 29 \times 50$

$a_{30} = 200 + 1450$

$a_{30} = 1650$

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

$S_{15} = 15\{400 + 29 \times 50\}$

$S_{15} = 15\{400 + 1450\}$

$S_{15} = 15\{1850\}$

$S_{15} = 15 \times 1850$

$= 27750$

16 $S_7 = 700$

$d = -20$

Let one be $= a - 20$

2nd $= a - 20 - 20 = a - 40$

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

$700 = \frac{7}{2}\{2a + 6x - 20\}$

$\frac{7}{2}\{2a - 120\}$

$100 = a - 60$

$160 = a$

$a = 160$

$a - 20 = 140$

$a - 40 = 120$

$a - 60 = 100$

$a - 80 = 80$

$a - 100 = 60$

$a - 120 = 40$

18 $\{0.5, 1.0, 1.5, 2.0 \ldots\}$

$a = 0.5 \quad d = 0.5 \quad n = 13$

$S_{13} = \pi\left[\frac{13}{2}\{2a + (n-1)d\}\right]$

$S_{13} = \pi\left[\frac{13}{2}\{1 + (n-1)0.5\}\right]$

$S_{13} = \pi\left[\frac{13}{2}\{1 + 12 \times 0.5\}\right]$

$S_{13} = \pi\left[\frac{13}{2}\{7\}\right]$

$S_{13} = \frac{22}{7} \times \frac{91}{2}$

$S_{13} = 143$

19. no of logs in 1st row = 20
no of logs in 2nd row = 19
no of logs in 3rd row = 18

$AP = \{20, 19, 18 \ldots\}$
$a = 20 \quad d = -1$

let no. of rows $= n$

$$S_n = \frac{n}{2}\{2a + (n-1)d\} = 200$$
$$200 = \frac{n}{2}\{40 + (n-1)(-1)\}$$
$$200 = \frac{n}{2}\{40 - n + 1\}$$
$$200 = \frac{n}{2}\{41 - n\}$$
$$-n^2 + 41n = 400$$
$$n^2 - 41n + 400 = 0$$
$$n^2 - 16n - 25n + 400$$
$$n(n-16) - 25(n-16)$$
$$n = 16$$

$$a_{25} = a + 24d$$
$$= 20 - 24$$
$$= -4 \quad (D)$$

$$a_{16} = a + 15d$$
$$= 20 + 15 \times -1$$
$$= 20 - 15$$
$$= 5$$