

$$\textcircled{15} \quad a_3 + a_8 = 7$$

$$a + 2d + a + 7d = 7$$

$$\Rightarrow 2a + 9d = 7 \dots \textcircled{1}$$

$$a_7 + a_{14} = -3$$

$$\Rightarrow a + 6d + a + 13d = -3$$

$$\Rightarrow 2a + 19d = -3 \dots \textcircled{11}$$

$$\textcircled{11} - \textcircled{1}$$

$$10d = -10$$

$$\Rightarrow d = -1$$

Sub $\textcircled{1}$

$$2a + 9(-1) = 7$$

$$\Rightarrow 2a = 7 + 9$$

$$\Rightarrow a = \frac{16}{2}$$

$$\Rightarrow a = 8$$

$$a_{10} = a + 9d$$

$$= 8 + 9(-1)$$

$$= 8 - 9$$

$$= -1$$

$\textcircled{16}$ $-2, -4, -6, \dots, -100$
AP in reverse order
is

$$-100, -98, -96, \dots$$

$$a = -100, d = -98 + 100$$

$$= 2$$

$$a_{12} = a + 11d$$

$$= -100 + 11 \times 2$$

$$= -100 + 22$$

$$= -78$$

$$\textcircled{17} \quad 53, 48, 43, \dots$$

$$a = 53, d = 48 - 53$$

$$= -5$$

$$a_n < 0$$

$$a + (n-1)d < 0$$

$$53 + (n-1)(-5) < 0$$

$$\Rightarrow -5(n-1) < -53$$

$$\Rightarrow n-1 > \frac{53}{5}$$

$$\Rightarrow n-1 > 10.6$$

$$\Rightarrow n > 11.6$$

\therefore First -ve term
= 12

$\textcircled{18}$ nos between 10 and 300
 $11, 12, 13, \dots, 299$

nos with given
conditions

$$11, 15, 19, \dots, 299$$

$$a = 11, d = 15 - 11$$

$$= 4$$

$$a_n = 299$$

$$a + (n-1)d = 299$$

$$11 + (n-1)4 = 299$$

$$\Rightarrow 4(n-1) = 288$$

$$\Rightarrow n = 73$$

$$\textcircled{19} \quad -\frac{4}{3}, -1, -\frac{2}{3}, \dots, 4\frac{1}{3}$$

$$a = -\frac{4}{3}, d = -1 + \frac{4}{3}$$

$$= \frac{-3+4}{3}$$

$$= \frac{1}{3}$$

$$a_n = \frac{13}{3}$$

$$a + (n-1)d = \frac{13}{3}$$