

$$3 \text{ (iv)} \quad a_3 = 15, S_{10} = 125$$

$$d = ?, a_{10} = ?$$

$$a_3 = 15$$

$$a + 2d = 15$$

$$\Rightarrow a = 15 - 2d \dots \textcircled{1}$$

$$S_{10} = \frac{10}{2} [a + 9d]$$

$$^{25} 125 = \frac{1}{5} [2(15 - 2d) + 9d]$$

$$25 = 30 - 4d + 9d$$

$$\Rightarrow 5d = -5$$

$$\Rightarrow d = -1$$

at the Sub $\textcircled{1}$

$$a = 15 - 2(-1)$$

$$= 15 + 2$$

$$= 17$$

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

$$= 17 + 9(-1)$$

$$= 17 - 9$$

$$= 8$$

$$3 \text{ (v)} \quad d = 5, S_9 = 75, a = ?, a_9 = ?$$

$$S_9 = 75$$

$$\frac{9}{2} [2a + 8d] = 75$$

$$\Rightarrow 2a + 8d = \frac{75 \times 2}{9} \quad ^{25}$$

$$\Rightarrow 2a + 8 \times 5 = \frac{50}{3}$$

$$\Rightarrow 2a = \frac{50}{3} - \frac{40}{1}$$

$$\Rightarrow 2a = \frac{50 - 120}{3}$$

$$\Rightarrow \frac{1}{2} 2a = -\frac{70}{3} \quad ^{35}$$

$$\Rightarrow a = -\frac{35}{3}$$

$$a_9 = a + 8d$$

$$= -\frac{35}{3} + 8 \times 5$$

$$= -\frac{35}{3} + \frac{40}{1}$$

$$= \frac{-35 + 120}{3}$$

$$= \frac{85}{3}$$

$$3 \text{ (vi)} \quad a = 2, d = 8, S_n = 90,$$

$$n = ?, a_n = ?$$

$$S_n = 90$$

$$\frac{n}{2} [2a + (n-1)d] = 90$$

$$\frac{n}{2} [2 \times 2 + (n-1)8] = 90$$

$$\Rightarrow \frac{2n}{2} (2 + 4n - 4) = 90$$

$$\Rightarrow n(4n - 2) = 90$$

$$\Rightarrow 4n^2 - 2n - 90 = 0$$

$$\Rightarrow 2n^2 - n - 45 = 0$$

$$\Rightarrow 2n^2 - 10n + 9n - 45 = 0$$

$$\Rightarrow 2n(n-5) + 9(n-5) = 0$$

$$\Rightarrow (n-5)(2n+9) = 0$$

$$\Rightarrow n-5=0, 2n+9=0$$

$$\Rightarrow n=5, n=-\frac{9}{2}$$

rejected

$$a_5 = a + 4d$$

$$= 2 + 4 \times 8$$

$$= 34$$