

سوال 1:

$$\text{الف) } t_n = 2n^2 - 1 = 2, 11, 24, 47, 74$$

$$2 \times 1^2 - 1 = 2 \quad 2 \times 4^2 - 1 = 47$$

$$2 \times 2^2 - 1 = 11 \quad 2 \times 5^2 - 1 = 74$$

$$2 \times 3^2 - 1 = 24$$

$$\text{ب) } t_n = \frac{2n+1}{n+4} = \frac{2}{5}, \frac{3}{4}, 1, \frac{9}{5}, \frac{11}{4}$$

$$t_1 = \frac{2 \times 1 + 1}{1 + 4} = \frac{2}{5}$$

$$t_2 = \frac{2 \times 2 + 1}{2 + 4} = \frac{3}{4}$$

$$t_3 = \frac{2 \times 3 + 1}{3 + 4} = 1$$

$$t_4 = \frac{2 \times 4 + 1}{4 + 4} = \frac{9}{5}$$

$$t_5 = \frac{2 \times 5 + 1}{5 + 4} = \frac{11}{4}$$

$$\text{الف) } t_n = \frac{(-1)^n}{\sqrt{n+2}} \rightarrow t_{13} = \frac{(-1)^{13}}{\sqrt{13+2}} = \frac{-1}{\sqrt{14}} = \frac{-1}{\sqrt{14}} = -\frac{1}{\sqrt{14}}$$

سوال 2:

$$\text{ب) } t_n = 2n - \left[\frac{n}{4} \right] = t_{13} = 2 \times 13 - \left[\frac{13}{4} \right] = 24 - 3 = 21$$

$$\text{الف) } t_n = 2n - 10 \rightarrow \text{C.F. } \begin{array}{c} n \\ -10 \\ + \end{array}$$

سوال 3:

$$\text{ب) } t_n = n^2 - 14n + 40 \rightarrow t_n = (n-10)(n-4)$$

$$\begin{array}{c} n \\ + \quad -10 \\ - \quad -4 \\ + \end{array}$$

$$10 - 4 + 1 = 7 \quad \text{C.F. } 7$$

$$\text{الف) } t_n = 2n - 14 =$$

$$\begin{array}{c} n \\ -14 \\ + \end{array}$$

سوال 4:

$$1 - 1 + 1 = 1$$

$$\text{ب) } t_n = n^2 - 12n + 27 \rightarrow t_n = (n-9)(n-3)$$

$$\begin{array}{c} n \\ + \quad -9 \\ - \quad -3 \\ + \end{array}$$

$$9 - 3 + 1 = 7$$

سوال 5:

$$t_4 = 7$$

$$t_5 = ?$$

$$\frac{22 - 7}{9 - 4} = \frac{15}{5} = 3$$

$$t_5 = 22 + 3 - 2 = 23$$

$$t_6 = 22$$

$$2n - 2$$

سوال ۶:

الف) $t_n = n^2 - 4n + 2 \rightarrow t_1 = 1 - 4 + 2 = -1$ ✓

$t_1 = 1 - 4 + 2 = -1$ $t_2 = 4 - 8 + 2 = -2$ $t_3 = 9 - 12 + 2 = -1$ $t_4 = 16 - 16 + 2 = 2$ $t_5 = 25 - 20 + 2 = 7$

ب) $t_n = n^2 + 4n + 1 \rightarrow 1$ $t_1 = 1 + 4 + 1 = 6$ ✓

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$t_n = -4, -7, -1, -7, -4, \dots$
 $\begin{matrix} & \nearrow & \nearrow & \nearrow & \nearrow & \nearrow & \nearrow & \nearrow & \nearrow \\ -4 & -7 & -1 & -7 & -4 & 1 & 7 & 13 & 19 \\ & \nwarrow & \nwarrow & \nwarrow & \nwarrow & \nwarrow & \nwarrow & \nwarrow & \nwarrow \\ & +3 & +6 & +8 & +6 & +3 & +2 & +2 & +6 \end{matrix}$
 $t = 2a \rightarrow a = 1$

سوال ۷:

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~~$t_n = -4, -7, -1, -7, -4, 1, 7, 13, 19, 25, \dots$~~ ✓

$t_n = -4, -1, 8, 21$
 $\begin{matrix} & \nearrow & \nearrow & \nearrow \\ -4 & -1 & 8 & 21 \\ & \nwarrow & \nwarrow & \nwarrow \\ & +5 & +9 & +13 \\ & & +4 & +4 & +4 \end{matrix}$

$t = 2a \rightarrow a = 2$

سوال ۸:

$2n^2 + (-1n) - 7$ ✓ ۲

$2n^2 + (-1n) - 7$

$t_1 = 4 + b + c = -4 \rightarrow b + c = -8$
 $t_2 = 16 + 2b + c = -1 \rightarrow 2b + c = -17$
 $b = -9$

سوال ۹: $(-\infty, a+4], [2a+1, +\infty)$ متناهی باشد عدد a را بیابید.

$\rightarrow$ برابر $2a+1 = a+4 \Rightarrow a = 3$
 $D \neq [3, +\infty)$ ✓ ۲

$A = \{1, 2, 3, \dots, 100\}$

سوال ۱۰:

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الف) $n \rightarrow n([n]) \rightarrow \left[\frac{100}{2} \right] = 50$ ✓ $B = \left[\frac{100}{5} \right] = 20$

ب) $n \rightarrow n(n) \rightarrow \frac{100}{2} = 50$ $C \rightarrow 19$

ج) $n \times n \rightarrow$ جدای شمرده 100 $\left[\frac{100}{15} \right] = 6$ ✓

د) $n(B \cup C) = n(B) \cup n(C) - n(B \cap C) \rightarrow 20 + 19 - 4 = 35$

~~$n(B \cup C) = 20 + 19 - 4 = 35$~~ $\rightarrow 20 + 19 - 4 = 35$