

تکلیف ۱۴

آمارهای سهم تجربی

۲. عالی ۱۱

آفرین خیر و مر نوشت

$$a_n = \frac{1}{r} \times \frac{1}{r} \times \frac{1}{r}$$

$$a_n = \frac{1}{r} \times r^{n-1}$$

سوال ۱

$$\frac{a_{14}}{a_{13}} = \frac{\frac{1}{r} \times r^{14-1}}{\frac{1}{r} \times r^{13-1}}$$

$$a_b = \frac{1}{r} \times r^{b-1} = 254$$

$$\frac{\frac{1}{r} \times r^{14}}{\frac{1}{r} \times r^{13}} = r = 14$$

$$b^2 = a \cdot c$$

$$\frac{1}{r} \times r^{13} = 2 \quad \frac{1}{r} \times r^9 = 254$$

$$b^2 = 2 \times 254 \rightarrow b^2 = 508 \rightarrow b = \sqrt{508} = 22.31$$

$$\frac{1}{r} \times r^{n-1} = 128 \rightarrow r^{n-1} = 128 \times r$$

$$r^{n-1} = 254 \rightarrow n = 9$$

$$\left. \begin{array}{l} t_a = 12 \\ t_1 r^4 = 12 \\ t_A = 94 \\ t_1 r^9 = 94 \end{array} \right\} \frac{r^9}{r^4} = \frac{94}{12}$$

سوال ۲

$$\Rightarrow r^5 = 1 \rightarrow r = 1$$

$$t_a \Rightarrow t_1 \times r^4 = 12 \rightarrow t_1 = \frac{12}{r^4} \quad t_{10} = t_1 \times r^9 = \frac{12}{r^4} \times r^9$$

$$\Rightarrow t_{10} = 12 \times 128 = 1536$$

$$a_1 \times a_1 r^1 \times a_1 r^1 \times a_1 r^1 \times a_1 r^1 = r^4 \epsilon^4 \quad (\text{سوال ۳})$$

$$a_1 (r^1 \times r^1 \times r^1 \times r^1) = r^4 \epsilon^4$$

$$a_1 r^1 = r^4 \epsilon^4 \quad a_1 r^1 = a_{1r} \Rightarrow a_{1r}^4 = r^4 \epsilon^4$$

$$a_{1r}^4 = r^4 \epsilon^4 \rightarrow a_{1r} = r \epsilon^4 \quad (\text{الف})$$

$$a_1 \times a_{1r} = a_1 \times a_{1r}^4 = a_1^2 r^4, \quad a_1 r^1 = r^4 = a_{1r} \quad (\text{ب})$$

$$a_1^2 r^4 = (a_1 r^1)^2 = r^4 \quad (\text{ج})$$

$$(r \sqrt{r})^2 = r^b \times r^a \rightarrow 14 \times r = r^{b+a} \quad (\text{سوال ۴})$$

$$14r = r^{b+a} \rightarrow r^4 = r^{b+a}$$

$$b+a=4 \rightarrow \frac{b+a}{2} = \frac{4}{2} = 2 \quad (\text{د})$$

$$a_{1r} = 1-x \rightarrow a_1 r^1 = 1-x \quad (\text{سوال ۵})$$

$$a_{1r} = x \rightarrow a_1 r^1 = x$$

$$a_{11} = 1+x \rightarrow a_1 r^1 = x+1$$

$$\frac{a_{1r}}{a_{11}} = \frac{a_1 r^1}{a_1 r^1} \Rightarrow r^4 = \frac{x}{1-x} \left\{ \frac{a_{11}}{a_{1r}} = \frac{a_1 r^1}{a_1 r^4} \Rightarrow r^4 = \frac{1+x}{x} \right.$$

$$\frac{x}{1-x} = \frac{1+x}{x} \rightarrow rx = 1-x^2$$

$$rx^2 = 1 \rightarrow x^2 = \frac{1}{r} \rightarrow x = \frac{1}{\sqrt{r}}$$

۱ - از این طریق می توانیم ثابت کنیم که r^4 معنی نمی سازد بلکه باید $\frac{1}{\sqrt{r}}$ باشد

$$\rightarrow x = \frac{1}{\sqrt{r}} \quad (\text{ه})$$

آفرین 😊

1 /

(4 سوال)

$$\begin{cases} t_1 + t_2 = 1\Lambda \\ t_1 + t_2 = 1\Lambda \end{cases} \rightarrow \begin{cases} t_1 + t_1 r^1 = 1\Lambda \\ t_1 r + t_1 r^2 = 1\Lambda \end{cases} = \frac{t_1 (1+r^1)}{t_1 r (1+r)} = \frac{V}{W}$$

$$i.e., \frac{1+r^1}{r(1+r)} = \frac{V}{W} \rightarrow \frac{(1+r)(1-r+r^2)}{r(1+r)} = \frac{1-r+r^2}{r} = \frac{V}{W}$$

$$W(1-r+r^2) = Vr \rightarrow W - Wr + Wr^2 = Vr$$

$$Wr^2 - 10r + W = 0 \rightarrow \Delta = 100 - 4W = 48$$

$$r = \frac{10 \pm 1}{4} \rightarrow r = \frac{11}{4} \quad r = \frac{1}{4} \quad a = 1$$

$$a_1 \xrightarrow{r=\frac{1}{4}} 1 \quad a_2 \xrightarrow{\frac{1}{4}} \frac{1}{4} \quad a_3 \xrightarrow{\frac{1}{4}} \frac{1}{16} \quad a_4 \xrightarrow{\frac{1}{4}} \frac{1}{64}$$

$$r = \frac{1}{4}, r^2 = \frac{1}{16}, 1 - \frac{1}{4} = \frac{3}{4} \quad \text{و نه غير}$$

(4 سوال)

$$t_1 + t_2 + t_3 = 1\Lambda \rightarrow t_1 + t_1 r + t_1 r^2 = 1\Lambda$$

$$t_1 \times t_2 \times t_3 = 1V \rightarrow t_1 (1+r+r^2) = 1\Lambda$$

$$\rightarrow \int a \cdot ar \cdot ar^2 = 1V$$

$$a^3 r^3 = 1V \rightarrow ar = \frac{1}{r} \rightarrow a = \frac{1}{r^4}$$

$$\frac{1}{r} (1+r+r^2) = 1\Lambda \rightarrow W(1+r+r^2) = 1\Lambda r \rightarrow Wr^2 - 10r + W = 0$$

$$\Delta = 100 - 4W = 48$$

$$r = \frac{10 \pm 1}{4} \rightarrow r = \frac{11}{4} \quad r = \frac{1}{4}$$

$$r = \frac{1}{3}, a_1 = 1, a_2 = 3, a_3 = 9$$

اداء سوال 7

$$r = \frac{1}{3}, a_1 = 9, a_2 = 3, a_3 = 1$$

$$1 \times 3 \times 9 = 27 \quad 1 + 3 + 9 = 13$$

جواب اول تا سوم $\boxed{3, 9, 1}$

$$a_n = 1, 4, 16, \dots$$

$$\begin{matrix} \downarrow & \downarrow \\ \times 3 & \times 3 \end{matrix}$$

$$a_n = 1 \times 3^{n-1}$$

سوال 11

(الف)

$$S_n = a \left\{ \frac{q^n - 1}{q - 1} \right\} \Rightarrow 1 \left\{ \frac{3^{10} - 1}{3 - 1} \right\} = \frac{3^{10} - 1}{2}$$

$$\boxed{3^{10} - 1}$$

2

$$P_n = a_1^n \times r^{\frac{n(n-1)}{2}} \rightarrow 1^{10} \times 3^{\frac{10 \times 9}{2}}$$

(ب)

$$a_1^{10} (1 + 3 + 3^2 + \dots + 3^9)$$

$$r^{45}$$

سوال 9

$$(a + q - a_1), (a + q^2 - a_1 q), (a + q^3 - a_1 q^2), \dots$$

$$a_1 (q - 1), a_1 q (q - 1), (q - 1) a_1 q^2, \dots$$

t_1

t_r

$$\frac{A_r}{t_r} = \frac{a_1 q (q - 1)}{a_1 (q - 1)} = q \quad \frac{A_1}{t_1} = \frac{a_1 q^2 (q - 1)}{a_1 q (q - 1)} = q$$

$$\boxed{q = d}$$

(b) / 19

(c)

$$a, a+d, a+2d, \dots, a+(n-1)d$$

$$\left. \begin{aligned} S_n &= a + (a+d) + (a+2d) + \dots + [a+(n-1)d] \\ S_n &= [a+(n-1)d] + [a+(n-2)d] + \dots + a \end{aligned} \right\} +$$

$$\begin{aligned} \therefore S_n &= [a + [a+(n-1)d]] + [(a+d) + [a+(n-2)d]] + \dots \\ &\quad + [a+(n-1)d + a] \end{aligned}$$

$$a + [a+(n-1)d] = 2a + (n-1)d$$

$$(a+d) + [a+(n-2)d] = 2a + (n-1)d$$

$$\vdots$$
$$[a+(n-1)d] + a = 2a + (n-1)d \rightarrow \text{Total } n \text{ terms}$$

$$\therefore S_n = n \times [2a + (n-1)d]$$

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

(c)

$$a_1 + a_1r + a_1r^2 + a_1r^3 + \dots + a_1r^{n-1}$$

$$\{ S_n = a_1 + a_1r + a_1r^2 + a_1r^3 + a_1r^4 + \dots + a_1r^{n-1}$$

$$S_n \cdot r = a_1r + a_1r^2 + a_1r^3 + a_1r^4 + \dots + a_1r^n$$

$$S_n - S_n r = a_1 - a_1r^n \rightarrow S_n(1-r) = a_1(1-r^n)$$

$$\Rightarrow S_n = a_1 \left[\frac{1-r^n}{1-r} \right] \quad (\checkmark)$$