

موضوع: ۲. آزمون عالی نوشتاری

1) $\sqrt{(a-1)x^2+ax+b} \rightarrow a \neq 0 \rightarrow \sqrt{cx+b} \rightarrow cx+b \geq 0$

$\rightarrow b = -9$ ✓ (۲)

2) $\sqrt{x^2+2x+2-m^2} \rightarrow \Delta \leq 0 \rightarrow 4-4(2-m^2) \leq 0 \rightarrow 4m^2 \leq 4$

$\rightarrow m^2 \leq 1 \rightarrow -1 \leq m \leq 1 \rightarrow |1-(-1)| = 2$ ✓ (۲)

3) $f(x) = \frac{\sqrt{4-x^2}}{[x]+[-x]+1}$, $x \in \mathbb{Z} \rightarrow [x]+[-x]+1 = 1 \rightarrow \checkmark$

$\rightarrow 4-x^2 \geq 0 \rightarrow 4 \geq x^2 \rightarrow -2 \leq x \leq 2$ ✓ (۲)

4) الف) $y = \sqrt{x^2+3x^2} = \sqrt{x^2(x+3)} \rightarrow x^2(x+3) \geq 0$

$\rightarrow \frac{-3}{-1} + \frac{0}{0} + \frac{0}{0} \rightarrow D_f = [0, +\infty)$ ✓ (۲)

ب) $y = \sqrt{\frac{(x^2-1)(x^2-cx)}{x^2-1}} = \sqrt{\frac{(x-1)(x+1)(x-c)x^2}{(x-1)(x^2+1-x)}}$

$\rightarrow D_f = (-\infty, -1] \cup \{0\} \cup [c, +\infty)$ ✓ (۲)

5) الف) $y = \sqrt{|x-2|-c} \rightarrow |x-2|-c \geq 0 \rightarrow |x-2| \geq c$

$\rightarrow \textcircled{1} x > 2 \rightarrow x-2 \geq c \rightarrow x \geq c+2$
 $\rightarrow \textcircled{2} x < 2 \rightarrow 2-x \geq c \rightarrow 1 \geq x$ ✓ (۲)

ب) $4-|2-m| \geq 0 \rightarrow 4 \geq |2-m| \rightarrow -2 \leq m-2 \leq 2 \rightarrow 0 \leq m \leq 4$

$\rightarrow D_f = [-2, 4]$ ✓ (۲)

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$$6) \text{ الف) } 1 - n/n \geq 0 \rightarrow n > 0 \rightarrow 1 - n^r \geq 0 \rightarrow -1 \leq x \leq 1$$

$$\rightarrow n \leq 0 \rightarrow 1 + n^r \geq 0 \rightarrow \checkmark \rightarrow x \in (-\infty, 1]$$

$$\rightarrow \boxed{D_f = (-\infty, 1]} \quad \text{C}$$

$$7) \frac{1}{\sqrt{c - |n - \delta|} - 1} = y \rightarrow \begin{cases} 0 < c - |n - \delta| \geq 0 \rightarrow c \geq |n - \delta| \\ \sqrt{c - |n - \delta|} \neq 1 \end{cases}$$

$$0 \rightarrow n \geq \delta \rightarrow c \geq n - \delta \rightarrow 1 \geq n / c \geq \delta \cdot n \rightarrow n \geq \tau$$

$$\rightarrow 2 \quad c - |n - \delta| \neq 1 \rightarrow |n - \delta| \neq \tau \rightarrow n \neq \{v, c\}$$

$$\boxed{D_f = [\tau, 1] - \{c, v\}} \quad \text{D}$$

$$7) \text{ الف) } y = \frac{\sin x - 1}{\cos x} \rightarrow \cos x \neq 0 \rightarrow \boxed{D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{2}\right\}} \quad \text{C}$$

$$\rightarrow y = \frac{\cos x}{\sin x - 1} \rightarrow \sin x - 1 \neq 0 \rightarrow \sin x \neq \frac{1}{2} \rightarrow \boxed{D_f = \mathbb{R} - \left\{2k\pi \pm \frac{\pi}{6}\right\}} \quad \text{D}$$

$$8) \text{ الف) } y = \frac{n + c}{|2n + 1| - |n + c|} \rightarrow \frac{-c}{-n + \tau} \rightarrow \frac{-\frac{1}{2}}{n - \tau} \rightarrow y \neq 0$$

$$\rightarrow \begin{cases} -n + \tau \neq 0 \rightarrow n \neq \tau \quad \checkmark \\ -c - \tau \neq 0 \rightarrow n \neq -\frac{\tau}{c} \quad \checkmark \\ n - \tau \neq 0 \rightarrow n \neq \tau \quad \checkmark \end{cases} \rightarrow \boxed{D_f = \mathbb{R} - \left\{-\frac{\tau}{c}, \tau\right\}} \quad \text{C}$$

$$\rightarrow |2n + 1| - |n + c| \geq 0 \rightarrow \begin{cases} -n + \tau \geq 0 \rightarrow \tau \geq n \rightarrow n \leq -c \\ -c - \tau \geq 0 \rightarrow -\frac{\tau}{c} \geq n \geq -c \quad \checkmark \\ n - \tau \geq 0 \rightarrow n \geq \tau \quad \checkmark \end{cases}$$

$$\boxed{D_f = (-\infty, -\frac{\tau}{c}] \cup [\tau, +\infty)} \quad \text{D}$$

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$$9) f(n) = \sqrt{\log_{f(n)}^{(r_{n-1})}} \rightarrow \textcircled{1} r_{n-1} > 0 \rightarrow \underline{n > \frac{1}{r}}$$

$$\rightarrow \textcircled{2} \log_{f(n)}^{(r_{n-1})} > 0 \rightarrow r_{n-1} > 1 \rightarrow \underline{n > 1}$$

$$\rightarrow \textcircled{3} \log_{f(n)}^{(r_{n-1})} \geq 0 \rightarrow \log_{f(n)}^{r_{n-1}} \leq 1 \rightarrow r_{n-1} \leq f(n) \rightarrow \underline{n \leq c}$$

$$\rightarrow \boxed{Df = (1, c]} \quad \left(\begin{matrix} \in \\ \in \end{matrix} \right)$$

$$10) \text{ii) } y: \log(r \cos n + 1) \rightarrow r \cos n + 1 > 0 \rightarrow \cos n > -\frac{1}{r}$$

$$\rightarrow \boxed{Df = \left(rK\pi - \frac{r\pi}{c}, rK\pi + \frac{r\pi}{c} \right)} \quad \left(\begin{matrix} \in \\ \in \end{matrix} \right)$$

$$\rightarrow y: \sqrt{\log_{f(n)}^{n-1}} \rightarrow \textcircled{1} n+1 \neq 0 \rightarrow \underline{n \neq -1}$$

$$\rightarrow \textcircled{2} \frac{n-1}{n+1} > 0 \rightarrow \frac{-1}{+} \frac{1}{+}$$

$$\textcircled{3} \log_{f(n)}^{n-1} \geq 0 \rightarrow \frac{n-1}{n+1} \geq 1 \rightarrow \frac{-r}{n+1} \geq 0 \rightarrow \underline{n \leq -1}$$

$$\rightarrow \boxed{Df = (-\infty, -1)} \quad \left(\begin{matrix} \in \\ \in \end{matrix} \right)$$