ادبیات کنکور — الگوی A

۱-
$\log_n m = a \Rightarrow m = n^a$ 　 $\log_{mn} m = \log_{n\cdot n^a} n^a = \log_{n^{a+1}} n^a$

$\log_{mn} m^2 n = b \Rightarrow \underbrace{\log_{mn} mn}_{1} + \log_{mn} m = b$ 　 $= \frac{a}{a+1}\cancel{\log_n n} \Rightarrow b = 1 + \frac{a}{a+1}$ 　 $0 < \frac{a}{a+1} < 1$

$\boxed{[b] = 1}$

۲-
الف) $\sqrt{\dfrac{x}{\log_{\frac{1}{2}} x}}$ 　 $x > 0$ 　 I

$\log_{\frac{1}{2}} x \neq 0 \Rightarrow x \neq 1$ 　 II

$\dfrac{x}{\log_{\frac{1}{2}} x} \geq 0$ 　 (0, 1: $-\ +\ -$) 　 III

$I \cap II \cap III = \boxed{(0, 1)}$ 　 $x > 0$, $x < 1$

ب) $\dfrac{\log_4 (x^2 - x - 2)}{\sqrt{x^2 - 1} + 1}$

$x^2 - x - 2 > 0$
$(x-2)(x+1) > 0$ 　 (-1, 2: $+\ -\ +$) 　 $(-\infty, -1) \cup (2, +\infty)$ 　 I

$\sqrt{x^2 - 1} + 1 \neq 0$ همیشه مثبت

$x^2 - 1 \geq 0$ 　 $x^2 \geq 1$ 　 $(-\infty, -1] \cup [1, +\infty)$ 　 II

$I \cap II = \boxed{(-\infty, -1) \cup (2, +\infty)}$

۳-
$\left.\begin{array}{l} 2\log_9 a + \log_a 3 = 2 \\ 2\log_{3^2} a + \log_a 3 = 2 \end{array}\right\}$ 　 $\log_3 a + \log_a 3 = 2$ 　 $t + \frac{1}{t} = 2 \xrightarrow{\times t}$ 　 $t^2 + 1 - 2t = 0$ 　 $(t-1)^2 = 0$ 　 $t = 1 \Rightarrow \log_a 3 = 1 \Rightarrow \boxed{a = 3}$

۴-
$(\log \frac{5}{3})x^2 + (\log 9)x - \log 15 = 0$ 　 $\log 9 = \log 3^2 = 2\log 3 = 2 \times 0/4 = 0/8$

$\log \frac{5}{3} = \log 5 - \log 3 = \underbrace{\cancel{\log 10}}_{1} - \underbrace{\cancel{\log 2}}_{0/3} - \underbrace{\cancel{\log 3}}_{0/4} = 0/3$ 　 $\log 15 = -(\log 5 + \log 3) = -(\underbrace{\cancel{\log 10}}_{1} - \underbrace{\cancel{\log 2}}_{0/3} + \underbrace{\log 3}_{0/4}) = -1/1$

$0/3x^2 + 0/8x - 1/1 = 0$
$3x^2 + 8x - 11 = 0$
$x^2 + 8x - 33 = 0$ 　 $(x+11)(x-3) = 0$ 　 $\frac{-11}{3}$ 　 $\frac{3}{3}$ 　 یا 　 $\frac{3}{3} - (\frac{-11}{3}) = \boxed{\frac{14}{3}}$

۵-
$\log_{14} 10 = \dfrac{\log_2 10}{\log_2 14} = \dfrac{\cancel{\log_2 2} + \log_2 5}{\underbrace{\cancel{\log_2 2}}_{1} + \log_2 7} = \dfrac{1 + \frac{1}{\log_5 2}}{1 + \log_2 7} = \dfrac{1 + \frac{1}{0/5}}{1 + 2/8} = \boxed{\frac{3}{3/8} \simeq 0/78}$

۶-
$\log_{15} 6 = \dfrac{\log_3 6}{\log_3 15} = \dfrac{\log_3 2 + \cancel{\log_3 3}^{\,1}}{\log_3 5 + \cancel{\log_3 3}_{\,1}} = \dfrac{\frac{1}{\log_2 3} + 1}{\log_3 5 + 1} = \dfrac{\frac{1}{1/6} + 1}{1/5 + 1} = \dfrac{0/625 + 1}{1/5 + 1} = \boxed{\frac{1/625}{2/5} = 0/65}$

۷-
$\log_8 18 = m \Rightarrow \frac{1}{3}\log_2 18 = m \Rightarrow \log_2 18 = 3m$ 　 $\underbrace{\cancel{\log_2 2}}_{1} + \log_2 3 + \log_2 3 = 3m$

$2\log_2 3 = 3m - 1$

$\log_2 3 = \frac{3m-1}{2}$

$\log_4 12 = ? \Rightarrow \frac{1}{2}\log_2 12 = ?$

$\frac{1}{2}(\log_2 3 + \underbrace{\cancel{\log_2 4}}_{2}) = \frac{1}{2}(\frac{3m-1}{2} + 2) = \boxed{\frac{3m+3}{4}}$

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۸-

$(0/4)^{2x-1} = (\frac{125}{8})^{x^2}$

$(\frac{2}{5})^{2x-1} = (\frac{5}{2})^{3x^2}$

$(\frac{2}{5})^{1-2x} = (\frac{5}{2})^{3x^2}$

$1-2x = 3x^2$

$3x^2+2x-1=0$

$x^2+2x-3=0$

$(x+3)(x-1)$

$\frac{-3}{3}$ $\frac{1}{3}$

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$\log_8^{9x+1} = \log_8^{9(\frac{1}{3})+1} = \log_8^4 = \log_{2^3}^{2^2} = \frac{2}{3}\log_2^2 = \boxed{\frac{2}{3}}$

۹-

$\log_2^3 = a \Rightarrow 3 = 2^a$

$\log_8^b = \frac{2}{3}(1+a) \Rightarrow b = 8^{\frac{2}{3}(1+a)} \Rightarrow b = 2^{\cancel{3}(\frac{2}{\cancel{3}})(1+a)} \Rightarrow b = 2^{2+2a}$

$b = 2^2 \times 2^a \times 2^a \Rightarrow b = 4\times 3\times 3 = \underline{36}$

$\log_{10}^{3b-8} = \log_{10}^{3\times 36-8} = \log_{10}^{100} = 2$

۱۰-

$\frac{-b}{-4a} = \frac{1}{\log 4} \Rightarrow \frac{4a}{b} = \log 4$

$a = \frac{b+c}{2} \Rightarrow c = 2a-b$

$c = 2a - \frac{4a}{\log 4}$

$\frac{c}{a} = 2 - \frac{4}{\log 4}$

$\Rightarrow (\frac{1}{\sqrt[8]{2}})^{\frac{c}{a}}$

$\boxed{2^{\frac{-1}{8}\times\frac{c}{a}}}$

$2^{\frac{-1}{8}\times(2-\frac{4}{\log 4})} = 2^{\frac{-1}{4}+\frac{1}{2\log 4}} \Rightarrow 2^{\log_{16}^{10}-\frac{1}{4}} = 2^{\log_{16}^{10}+\log_{16}^{\frac{1}{2}}} = 2^{\log_{16}^{5}}$

$\frac{1}{2\log 4} = \frac{1}{\log 16} = \log_{16}^{10}$

$\Rightarrow 5^{\log_{16}^{2}} = \boxed{5^{\frac{1}{4}} = \sqrt[4]{5}}$

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