LEVEL-I

[SINGLE CORRECT CHOICE TYPE]

1. Consider the equation $\log_{10}(x + \pi) = \log_{10}(x) + \log_{10}(\pi)$, where x is a positive real number. This equation has -

(A) no solutions (B) exactly 1 solution

(C) exactly 2 solutions (D) more than 2, but infinitely many solutions

2. The sum of all the solutions to the equation $2 \log x - \log(2x - 75) = 2$ is

(A) 30 (B) 350 (C) 75 (D) 200

3. The number of solution of $\log(2x) = 2 \log (4x - 15)$ is -

(A) 1 (B) 2 (C) 3 (D) infinite

4. Solution set of the equation $\log(8 - 10x - 12x^2) = 3\log (2x - 1)$ is -

(A) {1} (B) {3, 2} (C) {5} (D) ϕ

5. Let $x = 2^{\log 3}$ and $y = 3^{\log 2}$ where base of the logarithm is 10, then which one of the following holds good ?

(A) $2x < y$ (B) $2y < x$ (C) $3x = 2y$ (D) $y = x$

LEVEL-II

6. The product of all values of x which make the following statement true $(\log_3 x)(\log_5 9) - \log_x 25 + \log_3 2 = \log_3 54$, is

(A) $\sqrt{5}$ (B) 5 (C) $5\sqrt{5}$ (D) 25

7. Suppose that, $\log_{10}(x - 2) + \log_{10} y = 0$ and $\sqrt{x} + \sqrt{y-2} = \sqrt{x+y}$

Then the value of $(x + y)$, is

(A) 2 (B) $2\sqrt{2}$ (C) $2 + 2\sqrt{2}$ (D) $4 + 2\sqrt{2}$

8. The real value of x for which the statement $\log_6 9 - \log_9 27 + \log_8 x = \log_{64} x - \log_6 4$ holds true, is

(A) 1/2 (B) 1/4 (C) 1/8 (D) 1/16

9. The real x and y satisfy simultaneously $\log_8 x + \log_4 y^2 = 5$ and $\log_8 y + \log_4 x^2 = 7$ then the value of xy is equal to

(A) 2^9 (B) 2^{12} (C) 2^{18} (D) 2^{24}

[MULTIPLE CORRECT CHOICE TYPE]

10. The equation $\frac{\log_8(8/x^2)}{(\log_8 x)^2} = 3$ has

(A) no integral solution (B) one natural solution

(C) two real solutions (D) one irrational solution

11. In which of the following case(s) the real number 'm' is greater than the real number 'n' ?

(A) $m = (\log_2 5)^2$ and $n = \log_2 20$ (B) $m = \log_{10} 2$ and $n = \log_{10} \sqrt[3]{10}$

(C) $m = \log_{10} 5.\log_{10} 20 + (\log_{10} 2)^2$ and $n = 1$ (D) $m = \log_{1/2}\left(\frac{1}{3}\right)$ and $n = \log_{1/3}\left(\frac{1}{2}\right)$

12. Select the correct statement.

(A) $\log_3 19 \cdot \log_{1/7} 3 \cdot \log_4\left(\frac{1}{7}\right) < 2$

(B) The equation $\log_{1/3}(x^2 + 8) = -2$ has two real solutions.

(C) Let $N = \log_2 15 \cdot \log_{1/6} 2 \cdot \log_3\left(\frac{1}{6}\right)$. The greatest integer which is less than or equal to N is 3.

(D) The equation $\log_4 x + \log_4(x + 2) = \log_4(3x)$ has no prime solution.

13. For the equation $\log_{3\sqrt{x}} x + \log_{3x} \sqrt{x} = 0$, which of the following do not hold good?

(A) no real solution
(B) one prime solution
(C) one integral solution
(D) no irrational solution

[SUBJECTIVE TYPE]

---

14. If $\log_{\sqrt{2}} \sqrt{x} + \log_2 x + \log_4(x^2) + \log_8(x^3) + \log_{16}(x^4) = 40$ then x is equal to

15. If $4^{\log_9 3} + 9^{\log_2 4} = 10^{\log_x 83}$, $(x \in R)$, then x is

Answers

RACE # 07

1. (B) **2.** (D) **3.** (B) **4.** (D) **5.** (D) **6.** (C) **7.** (C) **8.** (C) **9.** (A) **10.** (BC)
11. (AD) **12.** (BD) **13.** (ABD) **14.** 256 **15.** 10