LEVEL- I

[SINGLE CORRECT CHOICE TYPE]

1. How many distinct real numbers belong to the following collection

$$\left\{ln\left(4-\sqrt{15}\right); ln\left(4+\sqrt{15}\right); -ln\left(4-\sqrt{15}\right); -ln\left(4+\sqrt{15}\right); ln\left(\frac{4+\sqrt{15}}{4-\sqrt{15}}\right); ln\left(31+8\sqrt{15}\right)\right\}$$

(A) 2 (B) 3 (C) 4 (D) 5

2. If $\log x + \log 5 = \log x^2 - \log 14$, then x equal to (where base of the logarithm is 10)

(A) 2^{70} (B) 70 (C) either 0 or 70 (D) 70^2

3. $\log_{10}(\log_2 3) + \log_{10}(\log_3 4) + \log_{10}(\log_4 5) + ... + \log_{10}(\log_{1023} 1024)$ simplifies to

(A) a composite (B) a prime number

(C) rational which is not an integer (D) an integer

4. The value of 'a' for which $\frac{\log_a 7}{\log_6 7} = \log_\pi 36$ holds good, is

(A) $1/\pi$ (B) π^2 (C) $\sqrt{\pi}$ (D) 2

5. Given that log (2) = 0.3010....., number of digits in the number 2000^{2000} is

(A) 6601 (B) 6602 (C) 6603 (D) 6604

6. Let N be the number of digits in the number 64^{64} then the value of N, is - (use $\log_{10} 2 = 0.3010$)

(A) 78 (B) 84 (C) 144 (D) 116

LEVEL-II

7. If $a^4 \cdot b^5 = 1$ then the value of $\log_a(a^5b^4)$ equals

(A) 9/5 (B) 4 (C) 5 (D) 8/5

8. If $\log_{ab} a = 4$ and the value of $\log_{ab}\left(\frac{\sqrt[3]{a}}{\sqrt{b}}\right) = \frac{p}{q}$, where p & q are coprimes, then value of |p – q| is equal to

(A)5 (B) 6 (C) 11 (D) 17

9. Given $\log_{10} 2 = a$ and $\log_{10} 3 = b$. if $3^{x+2} = 45$. The value of x in terms of a and b is

(A) $\frac{a-1}{b}$ (B) $\frac{1-a}{b}$ (C) $\frac{1+a}{b}$ (D) $\frac{b}{1-a}$

10. If $\log_y x + \log_x y = 7$, then the value of $(\log_y x)^2 + (\log_x y)^2$, is

(A) 43 (B) 45 (C) 47 (D) 49

11. Which one of the following is the smallest ?

(A) $\log_{10}\pi$ (B) $\sqrt{\log_{10}\pi^2}$ (C) $\left(\frac{1}{\log_{10}\pi}\right)^3$ (D) $\left(\frac{1}{\log_{10}\sqrt{\pi}}\right)$

12. Number of digits in $4^{16}.\ 5^{25}$ is (use $\log_{10}2 = 0.3010$)

(A) 27 (B) 28 (C) 29 (D) 30

[MULTIPLE CORRECT CHOICE TYPE]

13. Which of the following when simplified, reduces to unity ?

(A) $\log_{10}5.\log_{10}20+\log_{10}^2 2$ (B) $\dfrac{2\log 2+\log 3}{\log 48-\log 4}$

(C) $-\log_5\log_3\sqrt{\sqrt[5]{9}}$ (D) $\dfrac{1}{6}\log_{\frac{\sqrt{3}}{2}}\left(\dfrac{64}{27}\right)$

14. If $\log_4 5 = x$ and $\log_5 6 = y$, then

(A) $\log_4 6 = xy$ (B) $\log_6 4 = xy$ (C) $\log_3 2 = \dfrac{1}{2xy-1}$ (D) $\log_2 3 = \dfrac{1}{2xy-1}$

15. If $x = (\text{antilog}_2 3)(\text{antilog}_3 4)$, $y = \text{antilog}_6 2$ and $\dfrac{x}{y}=\dfrac{p}{q}$ in lowest form (where $p,q \in N$), then $(p + q)$is less than or equal to

(A) 20 (B) 19 (C) 18 (D) 17

[MATRIX TYPE]

Has **four** statements (A,B,C and D) given in **Column-I** and **four** statements (P, Q, R and S) given in **Column-II**. Any given statement in **Column-I** can have correct matching with one or more statement(s) given in **Column-II.**

16.

Column-I	**Column-II**
(A) Anti logarithm of $(0.\overline{6})$ to the base 27 has the value equal to	(P) 5
(B) Characteristic of the logarithm of 2008 to the base 2 is	(Q) 7
(C) The value of b satisfying the equation $\log_e 2\ .\ \log_b 625 = \log_{10}16\ .\ \log_e 10$ is	(R) 9
(D) Number of naughts after decimal before a significant figure comes in the number $\left(\dfrac{5}{6}\right)^{100}$, is	(S) 10

[SUBJECTIVE TYPE]

17. Simplify $\dfrac{1}{1+\log_b a+\log_b c}+\dfrac{1}{1+\log_c a+\log_c b}+\dfrac{1}{1+\log_a b+\log_a c}$ is (in terms of abc)

18. $\left(\log_8 27-\log_{0.5}\dfrac{1}{3}\right).\left(\dfrac{\log_3 12}{\log_{36}3}-\dfrac{\log_3 4}{\log_{108}3}\right)$

19. $\log_{\sqrt{6}}3.\log_3 36+\log_{\sqrt{3}}8.\log_4 81$

20. Evaluate $\dfrac{\left((64)^{\frac{1}{\log_5 8}}+2^{\frac{2}{\log_{\sqrt{5}}2}}\right)\left(\left(\sqrt{11}\right)^{\frac{2}{\log_{25}11}}-(64)^{\log_8\sqrt{5}}\right)}{300}$

Answers

RACE # 06

1. (B) **2.** (B) **3.** (D) **4.** (C) **5.** (C) **6.** (D) **7.** (A) **8.** (C) **9.** (B) **10.** (C)
11. (A) **12.** (B) **13.** (ABC) **14.** (AC) **15.** (AB) **16.** A-R ; B-S ; C-P ; D-Q **17.** 1
18. 0 **19.** 16 **20.** 2