Topic: Logarithm

Sub: Mathematics **Assignment: 03 Repeater** Prof. Chetan Sir

Logarithm Questions

1. Values of: $\log_{(\sqrt{3}-\sqrt{2})}(5-2\sqrt{6})$ is:

(A) -2 (B) $\frac{1}{2}$ (C) 2 (D) $-\frac{1}{2}$

2. Value of: $(\log_{2\sqrt{2}} 8 - \log_{36} 6)$ is equal to:

(A) 0 (B) $\frac{3}{2}$ (C) 1 (D) $\frac{1}{2}$

3. Simplified value of expression: $\log_{81} 27 + \log_{125} 25$ is equal to:

(A) $\frac{17}{12}$ (B) 3 (C) $\frac{3}{2}$ (D) $\frac{5}{4}$

4. Value of x satisfying: $\log_5(\log_4 x) = 0$

(A) 0 (B) 1 (C) 4 (D) 5

5. Value of: $\log_{\frac{1}{9}}(\log_5 125)$

(A) $\frac{1}{2}$ (B) 2 (C) -2 (D) $-\frac{1}{2}$

6. Simplified value of expression: $\log_6 18 + \log_6 2 - log_2 3 - log_2(\frac{1}{3}) =$

(A) 2 (B) 1 (C) 0 (D) -1

7. Simplified value of: $\log_2 3 \cdot \log_3 5 \cdot \log_5 7 \cdot \log_7 8 =$

(A) 0 (B) 1 (C) 3 (D) 2

8. Value of: $\log(\frac{9}{20}) + \log(\frac{25}{18}) + \log(\frac{8}{5}) =$

(A) 0 (B) 1 (C) log(1800) (D) 2

9. If $\log_{2a} a = x, \log_{3a} 2a = y$ and $\log_{4a} 3a = z$, then value of $(xyz - 2yz) =$

(A) -1 (B) 1 (C) 0 (D) 2

10. Value of: $\frac{1}{\log_3 12} + \frac{1}{\log_8 12} + \frac{1}{\log_6 12} =$

(A) -1 (B) 1 (C) 0 (D) 2

11. Value of $log_2 8 + log_{\frac{1}{2}} 4 - log_9 \frac{1}{3} =$

(A) $\frac{9}{2}$ (B) 2 (C) $\frac{3}{2}$ (D) 1

12. Value of: $2\log_2(\frac{2}{3}) + \log_2(15) + \log_2(\frac{3}{5}) =$

(A) 2 (B) 1 (C) $\log_2 3$ (D) $\log_2 5$

13. $\frac{1}{1+\log_b a+\log_b c} + \frac{1}{1+\log_c a+\log_c b} + \frac{1}{1+\log_a b+\log_a c}$ has the value of equal to:

(A) abc (B) $\frac{1}{abc}$ (C) 0 (D) 1

14. If $a = \log_{24} 12, b = \log_{36} 24$ and $c = \log_{48} 36$ then $1 + abc =$

(A) $2bc$ (B) $2bc + 1$ (C) $bc - 1$ (D) $bc + 1$

15. If $\log_2(4 + \log_3(x)) = 3$, then sum of digits of x is:

(A) 3 (B) 6 (C) 9 (D) 18

16. Sum of all the solution(s) of the equation $\log_{10}(x) + \log_{10}(x + 2) - \log_{10}(5x + 4) = 0$ is:

(A) -1 (B) 3 (C) 4 (D) 5

17. Product of solutions of equation $|\log_{10}(2x)| = 3$ is:

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

18. Find the value of $\frac{1}{\log_2 36} + \frac{1}{\log_3 36}$.

19. Calculate: $4^{5\log_{4\sqrt{2}}(3-\sqrt{6})-6\log_8(\sqrt{3}-\sqrt{2})}$

20. The number of real values of parameter k for which $(\log_{16} x)^2 - \log_{16} x + \log_{16} k = 0$ will have exactly one solution is:

(A) 0 (B) 2 (C) 1 (D) 4

21. If $\log_{1/2} \frac{x^2+6x+9}{2(x+1)} < -\log_2(x + 1)$, then x lies in the interval:

(A) $(-1, 1 + 2\sqrt{2})$ (B) $(1 - 2\sqrt{2}, 2)$
(C) $(-1, \infty)$ (D) None of these

22. Solution set of the inequality $\log_3(x + 2)(x + 4) + \log_{1/3}(x + 2) < \frac{1}{2}\log_{\sqrt{3}} 7$ is:

(A) $(-2, -1)$ (B) $(-2, 3)$
(C) $(-1, 3)$ (D) $(3, \infty)$

23. Solution set of equation $|1-\log_{\frac{1}{6}} x|+|-\log_{\frac{1}{2}} x|+2 = |3-\log_{\frac{1}{6}} x-\log_{\frac{1}{2}} x|$ is $[\frac{a}{b}, a]$, where a, $b \in N$. The value of $a+b$ is:

(A) 5 (B) 6 (C) 7 (D) 8

24. The value of $5^{\sqrt{\log_5 7}} - 7^{\sqrt{\log_7 5}}$ is:

(A) $\log 2$ (B) 1
(C) 0 (D) none of these

25. The value of $2^{\log_3 7} - 7^{\log_3 2}$ is:

(A) $\log 2$ (B) 1
(C) 0 (D) none of these

26. If $9a^2 + 4b^2 = 18ab$, then $\log(3a + 2b) =$

(A) $\log 5 + \log 3 + \log a + \log 5b$ (B) $\log 5 + \log 3 + \log 3a + \log b$
(C) $\log 5 + \log a + \log b$ (D) none of these

27. The value of $\log_{\sqrt{2}} \sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}$ is:

(A) $\frac{15}{16}$ (B) $\frac{7}{16}$ (C) $\frac{15}{8}$ (D) $\frac{31}{32}$

28. The equation $\log_e x + \log_e(1+x) = 0$ can be written as:

(A) $x^2 + x - 1 = 0$ (B) $x^2 + x + 1 = 0$
(C) $x^2 + x - e = 0$ (D) $x^2 + x + e = 0$

29. If $x = \log_a(bc)$, $y = \log_b(ca)$ and $z = \log_c(ab)$, then which of the following is correct?

(A) $x + y + z = 1$ (B) $\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z} = 1$
(C) $xyz = 1$ (D) none of these

30. If $\log_2 \sin x - \log_2 \cos x - \log_2(1 - \tan^2 x) = -1$, then $x =$

(A) $\frac{n\pi}{2} + \frac{\pi}{8}, n \in Z$ (B) $n\pi - \frac{\pi}{8}, n \in Z$
(C) $\frac{n\pi}{4} + \frac{\pi}{2}, n \in Z$ (D) none of these

31. If $\log_a x$, $\log_b x$, $\log_c x$ are in A.P., where $x \neq 1$, then $c^2 =$

(A) $(ab)^{\log_a b}$ (B) $(ac)^{\log_a b}$
(C) $(ab)^{\log_b a}$ (D) $(ac)^{\log_b a}$

32. If $2^{\log_{10} 3\sqrt{3}} = 3^{k \log_{10} 2}$, then $k =$

(A) $\frac{1}{2}$ (B) $\frac{3}{2}$ (C) 3 (D) 2

33. The value of $(0.16)^{\log_{2.5}(\frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} + \ldots + \infty)}$ is:

(A) 0.16 (B) 1 (C) 0.4 (D) 4

34. If $\log_{30} 3 = x$ and $\log_{30} 5 = y$, then $\log_{30} 8 =$

(A) $3(1 - x - y)$ (B) $x - y + 1$
(C) $1 - x - y$ (D) $2(x - y + 1)$

35. The solution set of $\log_2 |4 - 5x| > 2$ is:

(A) $(\frac{8}{5}, \infty)$ (B) $(\frac{4}{5}, \frac{8}{5})$
(C) $(-\infty, 0) \cup (\frac{8}{5}, \infty)$ (D) none of these

36. If $\log_y x + \log_x y = 2$ and $x^2 + y = 12$, then the value of xy is:

(A) 9 (B) 12 (C) 15 (D) 21

37. The number of roots of the equation $\log_{3\sqrt{x}} x + \log_{3x} \sqrt{x} = 0$ is:

(A) 1 (B) 2 (C) 3 (D) 0

38. If $\log_4 5 = a$ and $\log_5 6 = b$ then $\log_3 2$ is equal to:

(A) $\frac{1}{2a+1}$ (B) $\frac{1}{2b+1}$
(C) $2ab + 1$ (D) $\frac{1}{2ab-1}$

39. The value of $3^{\log_4 5} - 5^{\log_4 3}$ is:

(A) 0 (B) 1 (C) 2 (D) none of these

40. The solution set of the inequality $\log_{0.8}(\log_6(\frac{x^2+x}{x+4})) < 0$ is:

(A) $[-4, -2] \cup (8, \infty)$ (B) $(-4, -3) \cup [8, \infty)$
(C) $(-4, -3) \cup (8, \infty)$ (D) none of these

41. If $y = 3^{x-1} + 3^{-x-1}$ then the least value of y is:

(A) 2 (B) 6 (C) 2/3 (D) 3/2

42. If $xy^2 = 4$ and $\log_3(\log_2 x) + \log_{1/3}(\log_{1/2} y) = 1$, then x equals:

(A) 4 (B) 8 (C) 16 (D) 64

43. If $\log_2 x + \log_2 y \geq 6$, then the least value of $x + y$ is:

(A) 4 (B) 8 (C) 16 (D) 32

44. The solution set of the inequality $\frac{1}{2^x - 1} > \frac{1}{1 - 2^{x-1}}$ is:

(A) $(1, \infty)$
(B) $(0, \log_2(4/3))$
(C) $(-1, \infty)$
(D) $(0, \log_2(4/3)) \cup (1, \infty)$

45. If the equation $2^x + 4^y = 2^y + 4^x$ is solved for y in terms of x where $x < 0$, then the sum of the solutions is:

(A) $x \log_2(1 - 2^x)$
(B) $x + \log_2(1 - 2^x)$
(C) $\log_2(1 - 2^x)$
(D) $x \log_2(2^x + 1)$

46. The value of $\frac{\log_2 24}{\log_{96} 2} - \frac{\log_2 192}{\log_{12} 2}$ is _____.

47. If $\log_3\{5 + 4\log_3(x - 1)\} = 2$, then x is equal to _____.

48. The value of x satisfying $\sqrt{3}^{-4+2\log_{\sqrt{5}} x} = 1/9$ is _____.

49. If $\log_2 x + \log_x 2 = \frac{10}{3}$ and $\log_2 y + \log_y 2 = \frac{10}{3}$ with $x \neq y$, then $x + y =$

(A) $\frac{26}{3}$ (B) $8 + \sqrt[3]{2}$ (C) $\frac{32}{3}$ (D) $8\sqrt[3]{2}$

50. The number $N = 6\log_{10} 2 + \log_{10} 31$ lies between two successive integers whose sum is equal to _____.

Answer Key

1 (C)	**2** (B)	**3** (A)	**4** (C)	**5** (D)	**6** (A)	**7** (C)	**8** (A)	**9** (A)	**10** (D)
11 (C)	**12** (A)	**13** (D)	**14** (A)	**15** (C)	**16** (C)	**17** (D)	**18** (0.5)	**19** (9)	**20** (C)
21 (A)	**22** (B)	**23** (C)	**24** (C)	**25** (C)	**26** (D)	**27** (C)	**28** (A)	**29** (B)	**30** (A)
31 (D)	**32** (B)	**33** (D)	**34** (A)	**35** (C)	**36** (C)	**37** (B)	**38** (D)	**39** (A)	**40** (C)
41 (D)	**42** (C)	**43** (C)	**44** (D)	**45** (B)	**46** (3)	**47** (4)	**48** (1)	**49** (B)	**50** (7)