LOGRITHM ASSIGNMENT

1. $\log_4 18$ is

(a) A rational number (b) An irrational number (c) A prime number (d) None of these

2. The value of $(0.05)^{\log_{\sqrt{20}}(0.1+0.01+0.001+.....)}$ is

(a) 81 (b) $\frac{1}{81}$ (c) 20 (d) $\frac{1}{20}$

3. If *a, b, c* are distinct positive numbers, each different from 1, such that $[\log_b a \log_c a - \log_a a] + [\log_a b \log_c b - \log_b b] + [\log_a c \log_b c - \log_c c] = 0$, then *abc* =

(a) 1 (b) 2 (c) 3 (d) None of these

4. If $\log_{12} 27 = a$, then $\log_6 16 =$

(a) $2.\frac{3-a}{3+a}$ (b) $3.\frac{3-a}{3+a}$ (c) $4.\frac{3-a}{3+a}$ (d) None of these

5. If $n = 1983!$, then the value of expression $\frac{1}{\log_2 n} + \frac{1}{\log_3 n} + \frac{1}{\log_4 n} + ... + \frac{1}{\log_{1983} n}$ is equal to

(a) –1 (b) 0 (c) 1 (d) 2

6. If $\frac{\log x}{b-c} = \frac{\log y}{c-a} = \frac{\log z}{a-b}$, then which of the following is true

(a) $xyz = 1$ (b) $x^a y^b z^c = 1$ (c) $x^{b+c} y^{c+a} z^{a+b} = 1$ (d) $xyz = x^a y^b z^c$

7. If $x_n > x_{n-1} > ... > x_2 > x_1 > 1$ then the value of $\log_{x_1} \log_{x_2} \log_{x_3} ..... \log_{x_n} x_n^{x_{n-1}^{\cdot^{\cdot^{x_1}}}}$ is equal to

(a) 0 (b) 1 (c) 2 (d) None of these

8. The number of solution of $\log_2(x+5) = 6 - x$ is

(a) 2 (b) 0 (c) 3 (d) None of these

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

(a) 2 (b) 1 (c) 4 (d) None of these

10. If $x^{\frac{3}{4}(\log_3 x)^2 + \log_3 x - \frac{5}{4}} = \sqrt{3}$ then *x* has

(a) One positive integral value (b) One irrational value
(c) Two positive rational values (d) None of these

11. Solution set of inequality $\log_{10}(x^2 - 2x - 2) \le 0$ is

(a) $[-1, 1-\sqrt{3}]$ (b) $[1+\sqrt{3}, 3]$ (c) $[-1, 1-\sqrt{3}) \cup (1+\sqrt{3}, 3]$ (d) None of these

12. If $\frac{1}{2} \le \log_{0.1} x \le 2$ then.....

(a) The maximum value of *x* is $\frac{1}{\sqrt{10}}$ (b) x lies between $\frac{1}{100}$ and $\frac{1}{\sqrt{10}}$
(c) *x* does not lie between $\frac{1}{100}$ and $\frac{1}{\sqrt{10}}$ (d) The minimum value of *x* is $\frac{1}{100}$

13. If $\log_{0.04}(x-1) \ge \log_{0.2}(x-1)$ then *x* belongs to the interval

(a) $(1, 2]$ (b) $(-\infty, 2]$ (c) $[2, +\infty)$ (d) None of these

14. The set of real values of *x* for which $\log_{0.2} \frac{x+2}{x} \le 1$ is

(a) $\left(-\infty, -\frac{5}{2}\right] \cup (0, +\infty)$ (b) $\left[\frac{5}{2}, +\infty\right)$ (c) $(-\infty, -2) \cup (0, +\infty)$ (d) None of these

15. $\sum \frac{1}{1 + x^{a-b} + x^{a-c}} =$

(a) 1 (b) –1 (c) 0 (d) None of these

16. Let $\frac{7}{2^{1/2}+2^{1/4}+1} = A + B.2^{1/4} + C.2^{1/2} + D.2^{3/4}$, then

(a) $A = 1$ (b) $B = 3$ (c) $C = 2$ (d) $D = 1$

17. Solution of the equation $4.9^{x-1} = 3\sqrt{(2^{2x+1})}$ has the solution

(a) 3 (b) 2 (c) 3/2 (d) 2/3

18. Solution of the equation $9^x - 2^{x+\frac{1}{2}} = 2^{x+\frac{3}{2}} - 3^{2x-1}$

(a) $\log_9(9/\sqrt{8})$ (b) $\log_{(9/2)}(9/\sqrt{8})$ (c) $\log_e(9/\sqrt{8})$ (d) None of these

19. Let $u_n = \frac{1}{\sqrt{5}}\left[\left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n\right]$, $n = 0, 1, 2, ...$ then

(a) $u_{n+1} = u_n + u_{n-1}$ (b) $u_{2n-1} = u_n^2 + u_{n-1}^2$ (c) $u_{n+2} = u_n + u_{n+1}$ (d) None of these

20. $\sqrt{[6+2\sqrt{3}+2\sqrt{2}+2\sqrt{6}]} - 1/\sqrt{(5+2\sqrt{6})} =$

(a) 1 (b) –1 (c) 0 (d) None of these

21. $\sqrt{[x+2\sqrt{(x-1)}]} + \sqrt{[x-2\sqrt{(x-1)}]} =$

(a) 2, if $1 \le x \le 2$ (b) 2, if $x > 2$ (c) $2\sqrt{(x-1)}$, if $1 \le x \le 2$ (d) $2\sqrt{(x-1)}$, if $x > 2$

22. If the remainders of the polynomial $f(x)$ when divided by $x+1, x-2, x+2$ are 6, 3, 15 then the remainder of $f(x)$ when divided by $(x+1)(x+2)(x-2)$ is

(a) $2x^2 - 3x + 1$ (b) $3x^2 - 2x + 1$ (c) $2x^2 - x - 3$ (d) $3x^2 - 2x + 1$

23. If $\frac{1-\cos x}{\cos x(1+\cos x)} = \frac{\sin\alpha}{\cos x} - \frac{2}{1+\cos x}$, then $\alpha =$

(a) $\frac{\pi}{8}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{2}$ (d) π

24. If $\frac{x^2}{(x^2+a^2)(x^2+b^2)} = K\left(\frac{a^2}{x^2+a^2} - \frac{b^2}{x^2+b^2}\right)$ then $K =$

(a) $a^2 - b^2$ (b) $\frac{1}{a+b}$ (c) $\frac{1}{a-b}$ (d) $\frac{1}{a^2-b^2}$

25. The partial fractions of $\frac{x^4+24x^2+28}{(x^2+1)^3}$ are

(a) $\frac{1}{(x^2+1)} + \frac{22}{(x^2+1)^2} + \frac{5}{(x^2+1)^3}$ (b) $\frac{1}{(x^2+1)} + \frac{22}{(x^2+1)^2} - \frac{5}{(x^2+1)^2}$

(c) $\frac{1}{(x^2+1)} - \frac{22}{(x^2+1)^2} - \frac{5}{(x^2+1)^3}$ (d) None of these

26. $\frac{2x}{x^4+x^2+1} =$

(a) $\frac{x+1}{x^2-x+1} + \frac{x-1}{x^2+x-1}$ (b) $\frac{x-1}{x^2-x+1} - \frac{x+1}{x^2+x-1}$ (c) $\frac{x}{x^2-x+1} + \frac{x+1}{x^2+x-1}$ (d) $\frac{1}{x^2-x+1} - \frac{1}{x^2+x+1}$

27. If $\frac{x^3}{(2x-1)(x+2)(x-3)} = p + \frac{q}{2x-1} + \frac{r}{x+2} + \frac{s}{x-3}$, then

(a) $p = 1$ (b) $p = 2$ (c) $p = \frac{1}{2}$ (d) $6q - 3r + 2s = 3$

28. The partial fraction of $\frac{6x^4+5x^3+x^2+5x+2}{1+5x+6x^2} =$

(a) $x^2 + \frac{1}{1+2x} + \frac{1}{1+3x}$ (b) $x^2 - \frac{1}{1+2x} + \frac{1}{1+3x}$

(c) $x^2+\frac{1}{1+2x}-\frac{1}{1-3x}$ (d) None of these

29. If $\frac{\sin^2 x+1}{2\sin^2 x-5\sin x+3} = \frac{A}{(2\sin x-3)}+\frac{B}{(\sin x-1)}+C$, then

(a) $A=\frac{13}{2}$ (b) $B=2$ (c) $C=1$ (d) $A+B+C=5$

30. The coefficient of x^4 in the expansion of the expression $\frac{3x}{(x-2)(x+1)}$ is

(a) $-\frac{15}{16}$ (b) $\frac{15}{16}$ (c) $-\frac{16}{15}$ (d) $\frac{16}{15}$

31. The coefficient of x^5 in the expansion of $\frac{x^2+1}{(x^2+4)(x-2)}$ is

(a) $\frac{1}{256}$ (b) $\frac{1}{562}$ (c) $\frac{1}{265}$ (d) $-\frac{1}{256}$

32. The coefficient of x^n in the expression $\frac{x-4}{x^2-5x+6}$ when expanded in ascending powers of *x* is

(a) $\frac{-1}{2^n}-\frac{1}{3^{n+1}}$ (b) $\frac{1}{2^n}-\frac{1}{3^{n-1}}$

(c) $\frac{-1}{2^n}+\frac{1}{3^{n+1}}$ (d) $\frac{-1}{2^n}+\frac{1}{3^{n-1}}$

33. $\frac{3x^2+5}{(x^2+1)^2}=\frac{a}{x^2+1}+\frac{b}{(x^2+1)^2}$, then $(a,b)=$

(a) (2, 3) (b) (3, 2) (c) (– 2,3) (d) (–3, 2)

34. If $\frac{(x-1)^2}{x^3+x}=\frac{A}{x}+\frac{Bx+C}{x^2+1}$, then

(a) $A=1,B=0,C=2$ (b) $A=1,B=0,C=-2$

(c) $A=-1,B=0,C=-2$ (d) None of these

35. If $\frac{2x}{x^3-1}=\frac{A}{x-1}+\frac{Bx+C}{x^2+x+1}$, then

(a) $A=B=C$ (b) $A=B\neq C$ (c) $A\neq B=C$ (d) $A\neq B\neq C$

36. $\frac{x^2+1}{(2x-1)(x^2-1)}=$

(a) $\frac{-5}{3(2x-1)}+\frac{3}{(x+1)}+\frac{1}{(x-1)}$ (b) $\frac{-5}{3(2x-1)}+\frac{1}{3(x+1)}+\frac{1}{(x-1)}$

(c) $\frac{1}{2x-1}+\frac{5}{(x+1)}-\frac{3}{(x-1)}$ (d) None of these

37. If $\frac{ax-1}{(1-x+x^2)(2+x)}=\frac{x}{1-x+x^2}-\frac{1}{2+x}$, then $a=$

(a) 2 (b) 3 (c) 4 (d) 5

38. $\frac{1}{x(x^2+1)}=\frac{A}{x}+\frac{Bx+C}{(x^2+1)}$, then $(A,B,C)=$

(a) (1, – 1, 0) (b) $(-1,0,-1)$ (c) $(0,1,1)$ (d) None of these

39. If $\frac{ax^2+bx+c}{(x-1)(x+2)(2x+3)}=\frac{3}{x-1}+\frac{2}{x+2}-\frac{5}{2x+3}$, then

(a) $a=5$ (b) $b=-18$ (c) $c=22$ (d) None of these

40. If $\frac{(e^x+2)}{(e^x-1)(2e^x-3)}=-\frac{3}{e^x-1}+\frac{B}{2e^x-3}$, then $B=$

(a) 1 (b) 3 (c) 5 (d) 7

41. If $\frac{3x+4}{x^2-3x+2}=\frac{A}{x-2}-\frac{B}{x-1}$, then $(A,B)=$

(a) (7, 10) (b) (10, 7) (c) (10, – 7) (d) (– 10, 7)

42. If $a>0$, then $\sqrt{a+\sqrt{a+\sqrt{a+....\infty}}}$ is

(a) $\frac{1}{2}\sqrt{(4a-1)}$ (b) $\frac{1}{2}[1+\sqrt{(4a+1)}]$ (c) $\frac{1}{2}[1-\sqrt{(4a-1)}]$ (d) $\frac{1}{2}[1\pm\sqrt{(4a+1)}]$

43. $\frac{[4+\sqrt{(15)}]^{3/2}+[4-\sqrt{(15)}]^{3/2}}{[6+\sqrt{(35)}]^{3/2}-[6-\sqrt{(35)}]^{3/2}}=$

(a) 1 (b) 7/13 (c) 13/7 (d) None of these

44. If $x=\frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}, y=\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$, then $3x^2+4xy-3y^2=$

(a) $\frac{1}{3}[56\sqrt{10}-12]$ (b) $\frac{1}{3}[56\sqrt{10}+12]$ (c) $\frac{1}{3}[56+12\sqrt{10}]$ (d) None of these

45. The square root of $\sqrt{(50)}+\sqrt{(48)}$ is

(a) $2^{1/4}(3+\sqrt{2})$ (b) $2^{1/4}(\sqrt{3}+2)$ (c) $2^{1/4}(2+\sqrt{2})$ (d) $2^{1/4}(\sqrt{3}+\sqrt{2})$

46. $\sqrt{(3+\sqrt{5})}-\sqrt{(2+\sqrt{3})}=$

(a) $\sqrt{(5/2)}+\sqrt{(3/2)}$ (b) $\sqrt{(5/2)}-\sqrt{(3/2)}$ (c) $\sqrt{(5/2)}-\sqrt{(1/2)}$ (d) $\sqrt{(3/2)}-\sqrt{(1/2)}$

47. The value of $\sqrt{[12\sqrt{5}+2\sqrt{(55)}]}$ is

(a) $5^{1/2}[\sqrt{(11)}+1]$ (b) $5^{1/2}[\sqrt{(11)}-1]$ (c) $5^{1/4}[\sqrt{(11)}+1]$ (d) $5^{1/4}[\sqrt{(11)}-1]$

48. The cube root of $9\sqrt{3}+11\sqrt{2}$ is

(a) $2\sqrt{3}+\sqrt{2}$ (b) $\sqrt{3}+2\sqrt{2}$ (c) $3\sqrt{3}+\sqrt{2}$ (d) $\sqrt{3}+\sqrt{2}$

49. If $x+\sqrt{(x^2+1)}=a$, then $x=$

(a) $\frac{1}{2}(a+1/a)$ (b) $\frac{1}{2}(a-1/a)$ (c) $(a+a^{-1})$ (d) None of these

50. If $a=\sqrt{(21)}-\sqrt{(20)}$ and $b=\sqrt{(18)}-\sqrt{(17)}$, then

(a) $a=b$ (b) $a+b=0$ (c) $a>b$ (d) $a<b$