MATHS

BOOKS - CENGAGE MATHS (HINGLISH)

LOGARITHM AND ITS APPLICATIONS

Single Correct Answer Type

1. if $x \in N$, then the value of x satisfying the equation $5^x \cdot \left(8^{x-1}\right)^{\frac{1}{x}} = 500$ is divisible by

A. 2

B. 4

C. 3

D. 5

Answer: C

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2. If $\log_{175} 5x = \log_{343} 7x$, then the value of $\log_{42}\left(x^4 - 2x^2 + 7\right)$ is

A. 1

B. 2

C. 3

D. 4

Answer: A

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3. The value of $\log_{10}\left(\sqrt{3-\sqrt{5}} + \sqrt{3+\sqrt{5}}\right)$ is

A. $1/2$

B. $1/4$

C. $3/2$

D. $3/4$

Answer: A

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4. Which of the following is not the solution of $\frac{16^{1/x}}{2^{x+3}} > 1$?

A. $(-\infty, -4)$

B. (0,1)

C. $(0, \infty)$

D. none of these

Answer: C

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5. If $\log_4 A = \log_6 B = \log_9(A+B)$ then the value of $\frac{B}{A}$ is

A. $\frac{\sqrt{5}-1}{4}$

B. $\frac{\sqrt{5}+1}{4}$

C. $\frac{\sqrt{5}-1}{2}$

D. $\frac{\sqrt{5}+1}{2}$

Answer: D

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6. The value of $\log_{\frac{9}{4}}\left(\frac{1}{2\sqrt{3}}\sqrt{6-\frac{1}{2\sqrt{3}}\sqrt{6-\frac{1}{2\sqrt{3}}\sqrt{6-\frac{1}{2\sqrt{3}}}}}\ldots\infty\right)$ is

A. -2

B. -1

C. $-1/2$

D. none of these

Answer: C

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7. Number of real values of x satisfying the equation $\log_{x^2+6x+8}\left(\log_{2x^2+2x+3}\left(x^2-2x\right)\right)=0$ is equal to

A. 3

B. 2

C. 1

D. 0

Answer: C

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8. $10^{\log_p\left(\log_q\left(\log_r(x)\right)\right)}=1$ and $\log_q\left(\log_r\left(\log_p(x)\right)\right)=0$ then 'p' equals

A. $r^{q/r}$

B. rq

C. 1

D. $r^{r/q}$

Answer: A

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9. The greatest integer less than or equal to the number $\log_2(15) \times \log_{\frac{1}{6}} 2 \times \log_3\left(\frac{1}{6}\right)$ is

A. 4

B. 3

C. 2

D. 1

Answer: C

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10. Given that $\log_2 3 = a, \log_3 5 = b, \log_7 2 = c$,then the value of $\log_{140} 63$ is equal to

A. $\frac{2 + ac}{2c + 1 + abc}$

B. $\frac{1 + 2ac}{c + 2 + abc}$

C. $\frac{1 + 2ac}{2c + 1 + abc}$

D. $\frac{2 + ac}{c + 2 + abc}$

Answer: C

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11. If $\frac{\log_2 x}{4} = \frac{\log_2 y}{6} = \frac{\log_2 z}{3k}$ and $x^3 y^2 z = 1$, then k is equal to

A. -8

B. -4

C. 0

D. 4

Answer: A

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12. A line x=k intersects the graph of $y = \log_4 x$ and $y = \log_4(x + 4)$. The distance between the points of intersection is 0.5, then the value of k is

A. 1

B. 2

C. 3

D. 4

Answer: D

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13. let $N = \left(\frac{\log_3 135}{\log_{15} 3}\right) - \left(\frac{\log_3 5}{\log_{405} 3}\right)$

A. 1

B. 2

C. 3

D. 4

Answer: C

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14. $\frac{1}{\log_{ab}(abc)} + \frac{1}{\log_{bc}(abc)} + \frac{1}{\log_{ca}(abc)}$ is equal to:

A. $1/2$

B. 1

C. 2

D. 4

Answer: C

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15. $\log_a N.\log_b N + \log_c N.\log_b N + \log_a N.\log_c N$is equals to

A. $\dfrac{\log_a N.\log_b N.\log_c N}{\log_{abc} N}$

B. $\dfrac{\log_{abc} N}{\log_a N.\log_b N.\log_c N}$

C. $\dfrac{\log_N abc}{\log_N a.\log_N b.\log_N c}$

D. none of these

Answer: A

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16. There exist positive integers A, B and C with no common factors greater than 1, such that 1, such that $A\log_{200} 5 + B\log_{200} 2 = C$ The sum $A + B + C$ equals

A. 5

B. 6

C. 7

D. 8

Answer: B

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17. $\left(2^{\log_6 18}\right) \cdot \left(3^{\log_6 3}\right)$

A. 6

B. 9

C. 12

D. 18

Answer: A

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18. If $\log_a b = 2, \log_b c = 2,$ and $\log_3 c = 3 + \log_3$ a,then the value of c/(ab)is _____.

A. 1

B. 3

C. 9

D. 27

Answer: B

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19. If $\log_2 10 = P; \frac{\log_e 10}{\log_e 7} = q$ and $(11)^r = 10$, then which one of the following expressions is equivalent to $\log_{10} 154$?

A. pqr

B. $\frac{1}{pqr}$

C. $\frac{p+q+r}{pqr}$

D. $\frac{pq+qr+rp}{pqr}$

Answer: D

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20. If $3^{((\log_3 7))^x} = 7^{((\log_7 3))^x}$, then the value of x will be

A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. $\frac{1}{3}$

D. 1

Answer: A

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21. The value $4^{5\log_{4\sqrt{2}}\left(3-\sqrt{6}\right)-6\log_{8}\left(\sqrt{3}-\sqrt{2}\right)}$ is

A. 3

B. 6

C. 9

D. 27

Answer: C

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22. Compute the following $\frac{81^{\frac{1}{(\log)_5 9}}+3^{\frac{3}{(\log)_{\sqrt{6}}3}}}{409}\left(\sqrt{7}\right)^{\frac{2}{(\log)_{25}7}}-(125)^{(\log)_{25}6}$

A. 0

B. 1

C. 2

D. 3

Answer: B

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23. The value of $6^{\log_{10} 40} \cdot 5^{\log_{10} 36}$ is

A. 200

B. 216

C. 432

D. none of these

Answer: B

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24. The value of x for which the equation $5 \cdot 3^{\log_3 x} - 2^{1-\log_2 x} - 3 = 0$

A. 1

B. 2

C. $\frac{2}{5}$

D. 7

Answer: A

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25. The sum of all the values of a satisfying the equation $\begin{vmatrix} \log_{10} a & -1 \\ \log_{10}(a-1) & 2 \end{vmatrix} = \log_{10} a + \log_{10} 2$

A. 0

B. 1

C. 2

D. none of these

Answer: C

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26. The number of real solution(s) of the equation $9^{\log_3(\log_e x)} = \log_e x - (\log_e x)^2 + 1$ is equal to

A. 0

B. 1

C. 2

D. 3

Answer: B

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27. The solution set of the equation $x^{\log_x(1-x)^2} = 9$ is

A. $\{-2, 4\}$

B. $\{4\}$

C. $\{0, -2, -4\}$

D. none of these

Answer: B

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28. 98. The value of x satisfying the equation $\left((\sqrt{\pi})^{\log_{\pi}(x)}\right).\left((\sqrt{\pi})^{\log_{\pi^2}(x)}\right).\left((\sqrt{\pi}).^{\log_{\pi^4}(x)}\right).\left((\sqrt{\pi})^{\log_{\pi^8}(x)}\right)\ldots\infty = 3$ is equal to

A. $\sqrt{\pi}$

B. π

C. 3

D. $\frac{1}{3}$

Answer: C

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29. If $a > 1, x > 0$ and $2^{\log_a(2x)} = 5^{\log_a(5x)}$, then x is equal to

A. $\frac{1}{10}$

B. $\frac{1}{5}$

C. $\frac{1}{2}$

D. 1

Answer: A

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30. If x_1 and x_2 are solution of the equation $\log_5\left(\log_{64}|x| + (25)^x - \frac{1}{2}\right) = 2x$, then

A. $x_1 = 2x_2$

B. $x_1 + x_2 = 0$

C. $x_1 = 3x_2$

D. $x_1 x_2 = 64$

Answer: B

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31. Solve $\log_6 9 - \log_9 27 + \log_8 x = \log_{64} x - \log_6 4$..

A. $1/2$

B. $1/4$

C. $1/8$

D. $1/16$

Answer: C

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32. If $\log_2(\log_2(\log_2 x)) = 2$, then the number of digits in x, is $(\log_{10} 2 = 0.3010)$

A. 7

B. 6

C. 5

D. 4

Answer: C

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33. The number of integers satisfying the inequality $\log_{\sqrt{0.9}} \log_5 \left(\sqrt{x^2 + 5 + x} \right) > 0$ is

A. 6

B. 7

C. 8

D. 9

Answer: C

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34. The smallest integral x satisfying the inequality `(1-log_(4)x)/(1+log_(2)x)le (1)/(2)x is.

A. $\sqrt{2}$

B. 2

C. 3

D. 4

Answer: B

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35. The number of integral solutions of $\log_9(x+1).\log_2(x+1) - \log_9(x+1) - \log_2(x+1) + 1 < 0$ is

A. 4

B. 5

C. 6

D. 7

Answer: C

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36. The number of integers satisfying $\log_{\frac{1}{x}}\left(\frac{2(x-2)}{(x+1)(x-5)}\right) \geq 1$ is

A. 0

B. 1

C. 2

D. 3

Answer: A

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37. If $\log_{1/2}(4-x) \geq \log_{1/2} 2 - \log_{1/2}(x-1)$, then x can belong to

A. (1,2]

B. [1,3]

C. [3,4)

D. [2,3]

Answer: A::C

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38. Find the solution of the inequality $2\log_{\frac{1}{4}}(x+5) > \frac{9}{4}\log_{\frac{1}{3\sqrt{3}}}(9) + \log_{\sqrt{x+5}}(2)$

A. $(-5, -4)$

B. $(-3, -1)$

C. $(-4, -1)$

D. $(-5, -2)$

Answer: A::B

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39. If $\log_3 x - (\log_3 x)^2 \leq \frac{3}{2}\log_{(1/2\sqrt{2})} 4$, then x can belong to

A. $(-\infty, 1/3)$

B. $(9, \infty)$

C. (1,6)

D. $(-\infty, 0)$

Answer: A::B

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40. Which of the following is/are true ?

A. number of digits in $8^{12}5^{35}$ is 35

B. number of digits in $8^{12}5^{35}$ is 36

C. number of zeroes after decimal before a significant figures starts in $\left(\frac{8}{27}\right)^{20}$ is 10

D. number of zeroes after decimal before a significant figure starts in $\left(\frac{8}{27}\right)^{20}$ is 11

Answer: B::C

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Subjective Type

1. Find the value of x satisfying the equations $\log_3(\log_2 x) + \log_{1/3}\left(\log_{1/2} y\right) = 1$ and $xy^2 = 9$

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2. Let a and b be real numbers greater than 1 for which there exists a positive real number c, different from 1, such that $2(\log_a c + \log_b c) = 9\log_a bc$. Find the largest possible value of $\log_a b$.

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3. Solve :

$\log_3 x.\log_4 x.\log_5 x = \log_3 x.\log_4 x + \log_4 x.\log_5 + \log_5 x.\log_3 x.$

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4. Solve : $\frac{3}{2}\log_4 (x+2)^2 + 3 = \log_4 (4-x)^3 + \log_4 (6+x)^3.$

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5. $\log_{\frac{3}{4}} \log_8 \left(x^2+7\right) + \log_{\frac{1}{2}} \log_{\frac{1}{4}} \left(x^2+7\right)^{-1} = -2.$

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6. The value of x satisfying $5^{\log x} - 3^{\log x - 1} = 3^{\log x + 1} - 5^{\log x - 1}$, where the base of logarithm is 10 is not : 67 divisible by

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7. Solve: $\log_a x \log_a(xyz) = 48; \quad \log_a y \log_a(xyz) = 12;$ $\log_a z \log_a(xyz) = 84$

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8. Solve : $\sqrt[4]{|x-3|^{x+1}} = \sqrt[3]{|x-3|^{x-2}}.$

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9. Solve : $\log_{x^2} 16 + \log_{2x} 64 = 3.$

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