MATHS

BOOKS - SHRI BALAJI MATHS (ENGLISH)

LOGARITHMS

Exercise 1 Single Choice Problems

1. Solution set of the in equality $\log_{10^2} x - 3(\log_{10} x)(\log_{10}(x-2)) + 2\log_{10^2}(x-2) < 0$, is :

A. $(0, 4)$

B. $(-\infty, 1)$

C. $(4, \infty)$

D. $(2, 4)$

Answer: C

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2. 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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3. If a, b, c are positive numbers such that $a^{\log_3 7} = 27, b^{\log_7 11} = 49, c^{\log_{11} 25} = \sqrt{11}$, then the sum of digits of $S = a^{(\log_3 7)^2} + b^{(\log_7 11)^2} + c^{(\log_{11} 25)^2}$ is :

A. 15

B. 17

C. 19

D. 21

Answer: C

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4. Least positive integral value of 'a' for which $\log_{\left(x+\frac{1}{x}\right)}\left(a^2-3a+3\right)>0,(x>0)$:

A. 1

B. 2

C. 3

D. 4

Answer: C

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5. Let $P = \frac{5}{\frac{1}{\log_2 x} + \frac{1}{\log_3 x} + \frac{1}{\log_4 x} + \frac{1}{\log_5 x}}$ and $(120)^P = 32$, then the value of x be :

A. 1

B. 2

C. 3

D. 4

Answer: B

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6. Let x,y,z be positive real numbers such that$\log_{2x} z = 3, \log_{5y} z = 6$ and $\log_{xy} z = \frac{2}{3}$ then the value of z is

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

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

C. $\frac{3}{5}$

D. $\frac{4}{9}$

Answer: B

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7. Sum of values of x and y satisfying $\log_x(\log_3(\log_x y)) = 0$ and $\log_y 27 = 1$ is :

A. 27

B. 30

C. 33

D. 36

Answer: B

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8. $\log_{0.01} 1000 + \log_{0.1} 0.0001$ is equal to :

A. -2

B. 3

C. $-5/2$

D. $5/2$

Answer: D

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9. If $(\log)_{12} 27 = a,$ then find $(\log)_6 16 \int ermsofa$

A. $2\left(\frac{3-a}{3+a}\right)$

B. $3\left(\frac{3-a}{3+a}\right)$

C. $4\left(\frac{3-a}{3+a}\right)$

D. None of these

Answer: C

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10. If $\log_2(\log_2(\log_3 x)) = \log_2(\log_3(\log_2 y)) = 0$, then the value of $(x + y)$ is

A. 17

B. 9

C. 21

D. 19

Answer: A

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11. Suppose that a and b are positive real number such that $\log_{27} a + \log_9 b = 7/2$ and $\log_{27} b + \log_9 a = 2/3$. Then find the value

of ab.

A. 81

B. 243

C. 27

D. 729

Answer: B

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12. If $2^a = 5, 5^b = 8, 8^c = 11$ and $11^d = 14$, then the value of 2^{abcd} is :

A. 1

B. 2

C. 7

D. 14

Answer: D

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13. Which of the following conditions necessarily imply that the real number x is rational, I x^2 is rational II $x^3$and $x^5$are rational III $x^2$and x^3 are rational

A. I and II only

B. I and III only

C. II and III only

D. III only

Answer: C

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14. The value of $\frac{\log_8 17}{\log_9 23} - \frac{\log_{2\sqrt{2}} 17}{\log_3 23}$ is equal to

A. -1

B. 0

C. $\frac{\log_2 17}{\log_3 23}$

D. $\frac{4(\log_2 17)}{3(\log_3 23)}$

Answer: B

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15. The true solution set of inequality $\log_{(2x-3)}(3x-4) > 0$ is equal to :

A. $\left(\frac{4}{3}, \frac{5}{3}\right) \cup (2, \infty)$

B. $\left(\frac{3}{2}, \frac{5}{3}\right) \cup (2, \infty)$

C. $\left(\frac{4}{3}, \frac{3}{2}\right) \cup (2, \infty)$

D. $\left(\frac{2}{3}, \frac{4}{3}\right) \cup (2, \infty)$

Answer: B

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16. If P is the number of natural number whose logarithms to the base 10 have the characteristic p and Q is the number of natural numbers logarithms of whose reciprocals to the base 10 have the characteristic -q, then find the value of $\log_{10} P - \log_{10} Q$.

A. $p - q + 1$

B. $p - q$

C. $p + q - 1$

D. $p - q - 1$

Answer: A

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17. If $2^{2010} = a_n 10^n + a_{n-1} 10^{n-1} + \ldots\ldots\ldots\ldots + a_2 10^2 + a_1 \cdot 10 + a_0$, where $a_i \in \{0, 1, 2, \ldots\ldots\ldots, 9\}$ for all $i = 0, 1, 2, 3, \ldots\ldots\ldots\ldots, n$, then $n =$

A. 603

B. 604

C. 605

D. 606

Answer: C

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18. The number of zeros after decimal before the start of any significant digit in the number $N = (0.15)^{20}$ are :

A. 15

B. 16

C. 17

D. 18

Answer: B

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19. $\log_2\left[\log_4\left(\log_{10} 16^4 + \log_{10} 25^8\right)\right]$ simplifies to :

A. an irrational

B. an odd prime

C. a composite

D. unity

Answer: D

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20. The sum of all the solutions to the equations $2\log_{10} x - \log_{10}(2x - 75) = 2$

A. 30

B. 350

C. 75

D. 200

Answer: D

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21. $x^{(\log_x)\log_a y \log_y z}$ is equal to

A. x

B. y

C. z

D. x^x

Answer: C

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22. Number of solution(s) of the equation $x^{x\sqrt{x}} = \left(x\sqrt{x}\right)^{x}$ is/are :

A. 0

B. 1

C. 2

D. 3

Answer: C

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23. The difference of roots of the equation $\left((\log)_{27}x^{3}\right)^{2} = (\log)_{27}x^{6}$ is .....

A. $\frac{2}{3}$

B. 1

C. 9

D. 8

Answer: D

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24. If $\log_{10} x + \log_{10} y = 2, x - y = 15$ then :

A. (x, y) lies on the line $y = 4x + 3$

B. (x, y) lies on $y^2 = 4x$

C. (x, y) lies on $x = 4y$

D. (x, y) lies on $4x = y$

Answer: C

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25. $\sqrt{2^x \left(4^x (0.125)^{\frac{1}{x}}\right)^{\frac{1}{3}}} = 4.\left(2^{\frac{1}{3}}\right)$

A. $\frac{14}{5}$

B. 3

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

D. $-\frac{3}{5}$

Answer: D

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26. Sum of all values of x satisfying the equation $25^{(2x-x^2+1)}+9^{(2x-x^2+1)}=34\left(15^{(2x-x^2)}\right)$ is :

A. 1

B. 2

C. 3

D. 4

Answer: D

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27. If $a^x = b^y = c^z = d^w$, show that $\log_a(bcd) = x\left(\frac{1}{y} + \frac{1}{z} + \frac{1}{w}\right)$.

A. $z\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{w}\right)$

B. $y\left(\frac{1}{x} + \frac{1}{z} + \frac{1}{w}\right)$

C. $x\left(\frac{1}{y} + \frac{1}{z} + \frac{1}{w}\right)$

D. $\frac{xyz}{w}$

Answer: C

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28. If $x = \frac{4}{\left(\sqrt{5}+1\right)\left(\sqrt[4]{5}+1\right)\left(\sqrt[8]{5}+1\right)\left(\sqrt[16]{5}+1\right)}$. Then the value of $(1+x)^{48}$ is :

A. 5

B. 25

C. 125

D. 625

Answer: C

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29. If $\log_x \log_{18}\left(\sqrt{2}+\sqrt{8}\right) = \frac{1}{3}$, then the value of $32x =$

A. 2

B. 4

C. 6

D. 8

Answer: B

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30. Let $n \in N$, $f(n) = \begin{cases} \log_8 n & \text{if } \log_8 n \text{ is integer} \\ 0 & \text{otherwise} \end{cases}$, then the valud of $\sum_{n=1}^{2011} f(n)$ is :

A. 2011

B. 2011×1006

C. 6

D. 2^{2011}

Answer: C

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31. If the equation $\frac{\log_{12}(\log_8(\log_4 x))}{\log_5\left(\log_4\left(\log_y(\log_2 x)\right)\right)} = 0$ has a solution for 'x' when $c < y < b$, $y \neq a$, where 'b' is as large as possible, then the value of $(a + b + c)$ is equals to :

A. 18

B. 19

C. 20

D. 21

Answer: B

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32. If $\log_{0.3}(x-1) < \log_{0.09}(x-1)$, then x lies in the interval

A. $(2, \infty)$

B. $(1, 2)$

C. $(-2, -1)$

D. $\left(1, \frac{3}{2}\right)$

Answer: A

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33. Number of solutions of equation $\sqrt{7^{2x^2-5x-6}} = (\sqrt{2})^{3\log_2 49}$

A. 2

B. 1

C. 4

D. 5

Answer: C

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34. Let $1 \leq x \leq 256$ and M be the maximum value of $(\log_2 x)^4 + 16(\log_2 x)^2 \log_2\left(\frac{16}{x}\right)$. The sum of the digits of M is :

A. 9

B. 11

C. 13

D. 15

Answer: C

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35. 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: c

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36. 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. 1

B. 2

C. 3

D. 4

Answer: A

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37. A rational number which is 50 times its own logarithm to the base 10, is

A. 1

B. 10

C. 100

D. 1000

Answer: C

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38. If $x = \log_5(1000)$ and $y = \log_7(2058)$,then

A. $x > y$

B. $x < y$

C. $x = y$

D. none of these

Answer: A

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39. Find the value of $7\log\left(\frac{16}{15}\right) + 5\log\left(\frac{25}{24}\right) + 3\log\left(\frac{81}{80}\right)$.

A. 0

B. 1

C. log 2

D. log 3

Answer: C

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40. $\log_{10} \tan 1^\circ + \log_{10} \tan 2^\circ + \ldots . + \log_{10} \tan 89^\circ$ is equal to :

A. 0

B. 1

C. 27

D. 81

Answer: A

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41. $\log_7 \log_7 \sqrt{7\left(\sqrt{7\sqrt{7}}\right)} =$

A. $3\log_2 7$

B. $3\log_7 2$

C. $1 - 3\log_7 2$

D. $1 - 3\log_2 7$

Answer: C

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42. If $2x^{\log_4 3} + 3^{\log_4 x} = 27$, then x is equal to

A. 2

B. 3

C. 10

D. 30

Answer: C

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43. $x^{\log_{10}\left(\frac{y}{z}\right)} . y^{\log_{10}\left(\frac{z}{x}\right)} . z^{\log_{10}\left(\frac{x}{y}\right)}$ is equal to :

A. 0

B. 1

C. -1

D. 2

Answer: B

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44. Solve $(\log)_x 2(\log)_{2x} 2 = (\log)_{4x} 2.$

A. $\left\{2^{-\sqrt{2}}, 2^{\sqrt{2}}\right\}$

B. $\{1/2, 2\}$

C. $\{1/4, 2^2\}$

D. None of these

Answer: A

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45. The least value of the expression $2(\log)_{10}x - (\log)_x(0,01)\cdot$ for $x > 1,$ is 10 (b) 2 (c) -0.01 (d) 4

A. 2

B. 4

C. 6

D. 8

Answer: B

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46. If $\sqrt{(\log)_2 x} - 0.5 = (\log)_2 \sqrt{x,}$ then x equals odd integer (b) prime number composite number (d) irrational

A. odd integer

B. prime number

C. composite number

D. irrational

Answer: B

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47. If x_1 and x_2 are the roots of the equation $e^2 \cdot x^{Inx} = x^3$ with $x_1 > x_2$, then

A. $x_1 = 2x_2$

B. $x_1 = x_2^2$

C. $2x_1 = x_2^2$

D. $x_1^2 = x_2^2$

Answer: B

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48. Let M denote antilog $_{32}0.6$ and N denote the value of $49^{(1-\log_7 2)} + 5^{-\log_5 4}$. Then M.N is :

A. 100

B. 400

C. 50

D. 200

Answer: A

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49. If $\log_2(\log_2(\log_3 x)) = \log_3(\log_3(\log_2 y)) = 0$, then $x - y$ is equal to :

A. 0

B. 1

C. 8

D. 9

Answer: B

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50. $|\log_{\frac{1}{2}} 10 + |\log_4 625 - |\log_{\frac{1}{2}} 5|||| =$

A. $\log_{1/2} 2$

B. $\log_2 5$

C. $\log_2 2$

D. $\log_2 25$

Answer: C

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51. 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. $\frac{1}{2ab-1}$

Answer: D

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52. If $x = \log_a bc, y = \log_b ac$ and $z = \log_c ab$ then which of the following is equal to unity ?

A. $x + y + z$

B. xyz

C. $\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}$

D. $(1+x) + (1+y) + (1+z)$

Answer: C

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53. $x^{(\log_x) \log_a y \log_y z}$ is equal to

A. x

B. y

C. z

D. a

Answer: C

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54. Number of value(s) of 'x' satisfying the equation $x^{\log_{\sqrt{x}}(x-3)} = 9$ is/are

A. 0

B. 1

C. 2

D. 6

Answer: B

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55. $\log_{0.01} 1000 + \log_{0.1} 0.0001$ is equal to :

A. -2

B. 3

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

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

Answer: D

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56. Find the value of $7\log\left(\frac{16}{15}\right)+5\log\left(\frac{25}{24}\right)+3\log\left(\frac{81}{80}\right)$.

A. $2^{1/8}$

B. $(10)^{1/8}$

C. $(30)^{1/8}$

D. 1

Answer: A

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57. $\log_8(128)-\log_9\cot\left(\frac{\pi}{3}\right)=$

A. $\frac{31}{12}$

B. $\frac{19}{12}$

C. $\frac{13}{12}$

D. $\frac{11}{12}$

Answer: A

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58. Evaluate $\left\{\left(\frac{1}{\sqrt{27}}\right)^{2-\left[\frac{\log_5 13}{2\log_5 9}\right]}\right\}^{\frac{1}{2}}$

A. $\frac{5\sqrt{2}}{27}$

B. $\frac{\sqrt{2}}{27}$

C. $\frac{4\sqrt{2}}{27}$

D. $\frac{2\sqrt{2}}{27}$

Answer: D

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59. The sum of all the roots of the equation $\log_2(x-1)+\log_2(x+2)-\log_2(3x-1)=\log_2 4$

A. 12

B. 2

C. 10

D. 11

Answer: D

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60. $\frac{(\log_{100}10)(\log_2(\log_4 2))\left(\log_4 \log_{(2)^2}(256)^2\right)}{\log_4 8+\log_8 4}=$

A. $-\frac{6}{13}$

B. $-\frac{1}{2}$

C. $-\frac{8}{13}$

D. $-\frac{12}{13}$

Answer: D

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61. Let $\lambda = \log_5 \log_5(3)$. If $3^{k+5^{-\lambda}} = 405$, then the value of k is :

A. 3

B. 5

C. 4

D. 6

Answer: C

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62. A circle has radius $\log_{10}\left(a^2\right)$ and a circumference of $\log_{10}\left(b^4\right)$. Then the value of $\log_a b$ is equal to :

A. $\frac{1}{4\pi}$

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

C. 2π

D. π

Answer: D

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63. If $2^x = 3^y = 6^{-z}$, the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is equal to :

A. 0

B. 1

C. 2

D. 3

Answer: A

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64. The value of $\log_{\left(\sqrt{2}-1\right)}\left(5\sqrt{2}-7\right)$ is :

A. 0

B. 1

C. 2

D. 3

Answer: D

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65. Compute $\log_{ab}\left(\sqrt[3]{a}/\sqrt{b}\right)$ if $\log_{ab} a = 4.$

A. 2

B. $\frac{13}{6}$

C. $\frac{15}{6}$

D. $\frac{17}{6}$

Answer: D

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66. Identify the correct option

A. $\log_2 3 < \log_{1/4} 5$

B. $\log_5 7 < \log_8 3$

C. $\log_{\sqrt[3]{2}} \sqrt{3} < \log_{\sqrt[3]{2}} \sqrt{5}$

D. $2^{\frac{1}{4}} > \left(\frac{3}{2}\right)^{1/3}$

Answer: C

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67. Sum of all values of x satisfying the system of equations $5\left(\log_y x + \log_x y\right) = 26, xy = 64$ is :

A. 42

B. 34

C. 32

D. 2

Answer: B

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68. The product of all values of x satisfying the equations $\log_3 a - \log_x a = \log_{x/3} a$ is :

A. 3

B. $\frac{3}{2}$

C. 18

D. 27

Answer: D

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69. Solve for x, y, z.

$\log_2 x + \log_4 y + \log_4 z = 2$

$\log_3 y + \log_9 z + \log_9 x = 2$

$\log_4 z + \log_{16} x + \log_{16} y = 2$

A. $\frac{175}{12}$

B. $\frac{349}{24}$

C. $\frac{353}{24}$

D. $\frac{112}{3}$

Answer: C

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70. Find the value of $\left(\frac{1}{49}\right)^{1+\log_7 2} + 5^{-\log_{(1/5)}(7)}$.

A. $7\frac{1}{196}$

B. $7\frac{3}{196}$

C. $7\frac{5}{196}$

D. $7\frac{1}{98}$

Answer: A

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71. Solve the equation $\log_2(3-x) - \log_2\left(\frac{\sin\frac{3\pi}{4}}{5-x}\right) = \frac{1}{2} + \log_2(x+7)$

A. 0

B. 1

C. 2

D. 3

Answer: B

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72. If $\log_k x \log_5 k = \log_x 5, k \neq 1, k > 0$, then sum of all values of x is :

A. 5

B. $\frac{24}{5}$

C. $\frac{26}{5}$

D. $\frac{37}{5}$

Answer: A

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73. The values of x satisfying the equation $|x-1|^{\log_3 x^2 - 2\log_x 9} = (x-1)^7$ is /are

A. 162

B. $\frac{162}{\sqrt{3}}$

C. $\frac{81}{\sqrt{3}}$

D. 81

Answer: A

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74. The number of values of x satisfying the equation $\log_2\left(9^{x-1}+7\right)=2+\log_2\left(3^{x-1}+1\right)$ is :

A. 1

B. 2

C. 3

D. 0

Answer: B

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75. Which is the correct order for a given number $\alpha > 1$ in increasing order

A. $\log_2 \alpha < \log_3 \alpha < \log_e \alpha < \log_{10} \alpha$

B. $\log_{10} \alpha < \log_3 \alpha < \log_e \alpha < \log_2 \alpha$

C. $\log_{10} \alpha < \log_e \alpha < \log_2 \alpha < \log_3 \alpha$

D. $\log_3 \alpha < \log_e \alpha < \log_2 \alpha < \log_{10} \alpha$

Answer: B

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76. If $T_r = \dfrac{1}{\log_z 4}$ (where $r \in N$), then the value of $\sum_{r=1}^{4} T_r$ is :

A. 3

B. 4

C. 5

D. 10

Answer: C

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77.

In which of the following intervals does $\frac{1}{\log_{1/2}\left(\frac{1}{3}\right)} + \frac{1}{\log_{1/5}(1/3)}$ lies

i) (1,2)

ii) (2,3)

iii) (3,4)

iv) (4,5)

A. (1, 2)

B. (2, 3)

C. (3, 4)

D. (4, 5)

Answer: B

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78. If $\sin\theta = \frac{1}{2}\left(a + \frac{1}{a}\right)$ and $\sin 3\theta = \frac{k}{2}\left(a^3 + \frac{1}{a^3}\right)$, then $k + 6$ is equal to :

A. 3

B. 4

C. 5

D. -4

Answer: C

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79. Complete set of real values of x for which $\log_{(2x-3)}\left(x^2 - 5x - 6\right)$ is defined is :

A. $\left(\frac{3}{2}, \infty\right)$

B. $(6, \infty)$

C. $\left(\frac{3}{2}, 6\right)$

D. $\left(\frac{3}{2}, 2\right) \cup (2, \infty)$

Answer: B

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Exercise 2 One Or More Than One Answer Is Are Correct

1. Solve the equation $\frac{1 - 2\left(\log x^2\right)^2}{\log x - 2(\log x)^2} = 1$

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

B. $\frac{1}{\sqrt{20}}$

C. $\sqrt[3]{10}$

D. $\sqrt{10}$

Answer: A::C

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2. If $\log_a x = b$ for permissible values of a and x, then identify the statement(s) which can be correct.

A. If a and b are two irrational numbers then x can be rational.

B. If a rational and b irrational then x can be rational .

C. If a irrational and b rational then x can be rational.

D. If a rational and b rational then x can be rational.

Answer: A::B::C::D

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3. Which of the following quantities are irrational for the quadratic equation

$(\log_{10} 8)x^2 - (\log_{10} 5)x = 2(\log_2 10)^{-1} - x$?

A. Sum of the roots

B. Product of the roots

C. Sum of the coefficients

D. Discriminant

Answer: C::D

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4. Let

$A = MINIMUM(x^2 - 2x + 7), x \in R$ and $B = MINIMUM(x^2 - 2x$

then: $(\log)_{(B-A)}(A+B)$ is not defined $A + B = 13$

$(\log)_{(2B-A)} A < 1$ (d) $(\log)_{(2A-B)} A > 1$

A. $\log_{(B-A)}(A+B)$ is not defined

B. $A + B = 13$

C. $\log_{(2B-A)} A < 1$

D. $\log_{(2A-B)} A > 1$

Answer: A::B::C::D

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Exercise 3 Comprehension Type Problems

1. Let $\log_3 N = \alpha_1 + \beta_1$

$\log_5 N = \alpha_2 + \beta_2$

$\log_7 N = \alpha_3 + \beta_3$

where α_1, α_2 and α_3 are integers and $\beta_1, \beta_2, \beta_3 \in [0, 1)$.

Q. Difference of largest and smallest values of N if $\alpha_1 = 5, \alpha_2 = 3$ and $\alpha_3 = 2$.

A. 46

B. 45

C. 44

D. 47

Answer: C

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2. Let $\log_3 N = \alpha_1 + \beta_1$

$\log_5 N = \alpha_2 + \beta_2$

$\log_7 N = \alpha_3 + \beta_3$

where α_1, α_2 and α_3 are integers and $\beta_1, \beta_2, \beta_3 \in [0, 1)$.

Q. Difference of largest and smallest values of N if $\alpha_1 = 5, \alpha_2 = 3$ and $\alpha_3 = 2$.

A. 342

B. 343

C. 243

D. 242

Answer: A

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3. Let $\log_3 N = \alpha_1 + \beta_1$

$\log_5 N = \alpha_2 + \beta_2$

$\log_7 N = \alpha_3 + \beta_3$

where α_1, α_2 and α_3 are integers and $\beta_1, \beta_2, \beta_3 \in [0, 1)$.

Q. Difference of largest and smallest values of N if $\alpha_1 = 5, \alpha_2 = 3$ and $\alpha_3 = 2$.

A. 97

B. 100

C. 98

D. 99

Answer: D

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4. If

$\log_{10}|x^3+y^3|-\log_{10}|x^2-xy+y^2|+\log_{10}|x^3-y^3|-\log_{10}|x^2+xy+y^2$

. Where x, y are integers, then

Q. If $x=111$, then y can be :

A. ± 111

B. ± 2

C. ± 110

D. ± 109

Answer: C

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5. If

$\log_{10}|x^3+y^3|-\log_{10}|x^2-xy+y^2|+\log_{10}|x^3-y^3|-\log_{10}|x^2+xy+y^2$

. Where x, y are integers, then

Q. If $x=111$, then y can be :

A. ± 111

B. ± 15

C. ± 2

D. ± 110

Answer: B

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6. Given a right triangle ABC right angled at C and whose legs are given $1+4\log_{p^2}(2p), 1+2^{\log_2(\log_2 p)}$ and hypotenuse is given to be $1+\log_2(4p)$. The are of ΔABC and circle circumscribing it are Δ_1 and Δ_2 respectively, then

Q. $\Delta_1 + \frac{4\Delta_2}{\pi}$ is equal to :

A. 31

B. 28

C. $3+\frac{1}{\sqrt{2}}$

D. 199

Answer: A

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7. Given a right triangle ABC right angled at C and whose legs are given $1 + 4\log_{p^2}(2p), 1 + 2^{\log_2(\log_2(p))}$ and hypotenuse is given to be $1 + \log_2(4p)$. The area of $trian \leq ABC$ and circle circumscribing it are Δ_1 and Δ_2 respectively.

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

B. $\frac{1}{\sqrt{2}}$

C. $\frac{\sqrt{3}}{2}$

D. 1

Answer: C

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Exercise 5 Subjective Type Problems

1. The number $N = 6^{\log_{10} 40} . 5^{\log_{10} 36}$ is a natural number ,Then sum of digits of N is :

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2. The minimum value of 'c' such that $\log_b\left(a^{\log_2 b}\right) = \log_a\left(b^{\log_2 b}\right)$ and $\log_a\left(c-(b-a)^2\right) = 3$, where $a, b \in N$ is :

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3. How many positive integers b have the property that $\log_b 729$ is a positive integer ?

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4. The number of negative integral values of x satisfying the inequality $\log_{\left(x+\frac{5}{2}\right)}\left(\frac{x-5}{2x-3}\right)^2 < 0$ is :

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5. $\frac{6}{5}a^{(\log_a x)(\log_{10} a)(\log_a 5)} - 3^{\log_{10}\left(\frac{x}{10}\right)} = 9^{\log_{100} x + \log_4 2}$

(where $a > 0, a \neq 1$), then $\log_3 x = \alpha + \beta$, α is integer, $\beta \in [0, 1)$, then $\alpha =$

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6. If $\log_5\left(\frac{a+b}{3}\right) = \frac{\log_5 a + \log_5 b}{2}$, then $\frac{a^4+b^4}{a^2b^2} =$

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7. Let a, b, c, d be positive integers such that $(\log)_a b = \frac{3}{2} and (\log)_c d = \frac{5}{4}$. If $(a-c) = 9$, then find the value of

$(b-d)$.

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8. The number of real values of x satisfying the equation

$\log_{10}\sqrt{1+x}+3\log_{10}\sqrt{1-x}=2+\log_{10}\sqrt{1-x^2}$ is :

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9. The ordered pair (x, y) satisfying the equation

$x^2=1+6\log_4 y$ and $y^2=2^x y+2^{2x+1}$

and (x_1, y_1) and (x_2, y_2), then find the value of $\log_2|x_1x_2y_1y_2|$.

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10. If

$\log_7\log_7\sqrt{7\sqrt{7\sqrt{7}}}=1-a\log_7 2$ and $\log_{15}\log_{15}\sqrt{15\sqrt{15\sqrt{15\sqrt{15}}}}=1-$

, then $a+b=$

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11. The number of ordered pair(s) of (x, y) satisfying the equations

$\log_{(1+x)}\left(1-2y+y^2\right)+\log_{(1-y)}\left(1+2x+x^2\right)=4$ and $\log_{(1+x)}(1+$

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12. If $\log_b n=2$ and $og_n 2b=2$, then find the value of b.

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

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14. If x, y satisfy the equation, $y^x=x^y$ and $x=2y$, then $x^2+y^2=$

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15. Find the number of real values of x satisfying the equation.

$$\log_2\left(4^{x+1}+4\right)\cdot\log_2\left(4^x+1\right)=\log_{1/\sqrt{2}}\sqrt{\frac{1}{8}}$$

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16. If $x_1, x_2(x_1 > x_2)$ are the two solutions of the equation

$3^{\log_2 x}-12\left(x^{\log_{16}9}\right)=\log_3\left(\frac{1}{3}\right)^{3^3}$, then the value of x_1-2x_2 is :

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17. Find the number or real values of x satisfying the equation $9^{2\log_9 x}+4x+3=0.$

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18. If $\log_{16}\left(\log_{\sqrt[4]{3}}\left(\log_{\sqrt[3]{5}}(x)\right)\right)=\frac{1}{2}$, find x.

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19. The value $\left[\frac{1}{6}\left(\frac{2\log_{10}(1728)}{1+\frac{1}{2}\log_{10}(0.36)+\frac{1}{3}\log_{10}8}\right)^{1/2}\right]^{-1}$ is :

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