1. How many digits are there in 2^{100}

2. Find the no. of digits in 2^{99} in base system of 8

3. Determine which of the two numbers 31^{11} or 17^{14} is larger.

4. If 2^{2009} has m digits and 5^{2009} has n digits in their base-10 representations, then the value of m + n is

5. If $a = \log_x yz$, $b = \log_y zx$ & $c = \log_z xy$, where x, y, z are positive reals not equal to unity, then $abc - a - b - c$ is equal to :

   a. 2   b. 1   c. -1   d. Zero

6. If the logarithm of a number is −4.153, what are Characteristic and Mantissa?

7. If the logarithm of a number is −2.5, what are Characteristic and Mantissa?

8. Given log 2 = .3010, log 3 = .4771, . Find the number of leading zeros in $(2/3)^{2000}$

9. Find number of roots of equation log (x - 5) = log (7x + 1)

10. $\log_{24} 36 = x$, which of the following best describes $\log_{72} 96$

a) (8+2x)/(2+3x)   b) (8-2x)/(2+3x)   c)(8+2x)/(2-3x)   d)(8-2x)/(2-3x)

11. Assuming all logarithms to be well define, the value of

$$\frac{1}{\log_{bc^2} abc} + \frac{1}{\log_{ca^2} abc} + \frac{1}{\log_{ab^2} abc} \text{ equals :}$$

a. 3   b. 2   c. ½   d. 3/2

12. x and y are real numbers such that $2\log(x - 2y) = \log x + \log y$. What is the value of x/y ?
(a) 1 (b) 4 (c) Either (a) or (b) (d) None of these

13. If x is a real number such that $\log_3 5 = \log_5(2+x)$, then which of the following is true?

A $0 < x < 3$

B $23 < x < 30$

C $x > 30$

D $3 < x < 23$

14. It is known that Log 168750 = a and Log 51840 = b, Find the value of Log 30 in terms of a and b ?

a. (5a + 3b)/13

b. (3a+4b)/19

c. (3a+2b)/17

d. (2a +3b)/11

15. The number of zeros after decimal point till non-zero digit in 0.2^{50}

(log2=0.3010)

16. Find the total number of digits in the sum of

$1^1 + 2^2 + 3^3 + 4^4 + \ldots + 500^{500}$

17. If a and b are integers such that $\log_2(a+b) + \log_2(a-b) = 3$. Then how many different pairs (a, b) are possible?

(a) 0 (b) 1 (c) 2 (d) 3

18. If x is a positive quantity such that $2^x = 3^{\log_5 2}$. Then x is equal to

A $\log_5 8$

B $1 + \log_3(5/3)$

C $\log_5 9$

D $1 + \log_5(3/5)$

19. If $p^3 = q^4 = r^5 = s^6$, then the value of $\log_s(pqr)$ is equal to

A $47/10$

B $24/5$

C $16/5$

D 1

20. Determine all real values of x such that

$\text{Log}_{5x+9}(x^2 + 6x + 9) + \log_{x+3}(5x^2 + 24x + 27) = 4$

21. Given that log 3 = 0.477, log 7 = 0.845, log 2 = 0.301. Find the number of digits in y if $y = 252^{10}$

22. Simplify the following expression.

$$\log_{\sqrt{2}} \frac{2}{\sqrt{5} + \sqrt{3}} + \log_{\frac{1}{2}} \frac{1}{8 + 2\sqrt{15}}$$

23. $\log_4(x+2y) + \log_4(x-2y) = 1$, Find minimum value of $|x|-|y|$

24. The value of $\log_{0.008}(\sqrt{5}) + \log_{\sqrt{3}} 81 - 7$ is equal to

A 1/3

B 2/3

C 5/6

D 7/6

25. Find sum of all real x such that

$\log_{12}x+\log_{12}(x+1) = 1$

26. If $\log_2(5+\log_3 a) = 3$ and $\log_5(4a + 12 + \log_2 b) = 3$, then a + b is equal to

A 59

B 40

C 32

D 67

27. If log 2, log (2x -1) and log (2x + 3) are in A.P, then x is equal to

Answers

1. 31

2. 34

3. 17^14

4. 2010

5. A

6. Characteristic = -5

7. Characteristic= -3 and mantisa= 0.5

8. 352

9. 0

10. B

11. A

12. b

13. D

14. C

15. 34

16. 1350

17. C

18. D

19. 47/10

20. x = -3/2, 0, -1

21. 25 Digits

22. 2

23. Sqrt3

24. 5/6

25. 3

26. A

27. 5/2