SURDS AND INDICES

1. The value of $\left(\sqrt{125}\right)^{1/3}$ is:

(1) 2 (2) 4

(3) 5 (4) 8

(5) None of these

2. The value of $\left(\frac{1024}{243}\right)^{-4/5}$ is:

(1) $\frac{81}{16}$ (2) $\frac{81}{256}$

(3) $\frac{4}{9}$ (4) $\frac{9}{4}$

(5) None of these

3. If $16 \times 8^{n+2} = 2^m$, then m is equal to :

(1) n + 8 (2) 2n + 8

(3) 3n + 2 (4) 3n + 10

(5) None of these

4. The value of $\sqrt[3]{512} = 2^x$, then x is equal to:

(1) 5 (2) 4

(3) $\frac{3}{5}$ (4) 3

(5) None of these

5. The value of x satisfying $\sqrt{4+\sqrt[2]{x}} = 4$ is:

(1) 125 (2) 144

(3) 120 (4)

(5) None of these

6. If $5^{X+3} = (25)^{3x-4}$, then the value of x is:

(1) $\frac{5}{11}$ (2) $\frac{11}{5}$

(3) $\frac{11}{3}$ (4) $\frac{13}{5}$

(5) None of these

7. If $3^{4x-2} = 729$, then the value of x is:

(1) 1 (2) 1.5

(3) 2 (4)

(5) None of these

8. If $2^{2x-1} = \frac{1}{8^{x-3}}$, then n the value of x is:

(1) 3 (2) 2

(3) 0 (4) -2

(5) None of these

9. If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$, then n the value of x is:

(1) 1 (2) $\frac{1}{2}$

(3) $\frac{7}{2}$ (4) 3

10. If $2^X \times 8^{1/5} = 2^{1/5}$, then x is equal to:

(1) $\frac{1}{5}$ (2) $-\frac{1}{5}$

(3) $\frac{2}{5}$ (4) $-\frac{2}{5}$

(5) None of these

11. If $2^X - 2^{X-1} = 4$, then The value of x^3 is:

(1) 27 (2) 4

(3) 1 (4) 256

(5) None of these

12. The value of x for which $2^{X+4} - 2^{X-1} = 3$, is:

(1) 0 (2) -2

(3) 2 (4) 1

(5) None of these

13. The value of x for which $4^{2x} - 2^{2x} = 12$ holds, is:

(1) 2 (2) 3

(3) 1 (4) -1

(5) None of these

14. If $9^X - 10.3^x + 9 = 0$ then x is equal to:

(1) 2 or 0 (2) 1 or 3

(3) 1 or 9 (4) 1 or -2

(5) None of these

15. The value of $\sqrt[3]{x^{12}} + \sqrt[2]{x^6}$ is:

(1) x^7 (2) x^6

(3) x^8 (4) x^{10}

(5) None of these

16. If $2^{X-1} + 2^{X+1} = 320$, then value of x is:

(1) 6 (2) 8

(3) 5 (4) 7

(5) None of these

17. If $\frac{9^n \times 3^5 \times (27)^3}{3 \times (81)^4} = 27$, then n equals:

(1) 0 (b) 2

(3) 3 (4) 4

(5) None of these

18. The value of $\frac{3^{(12+n)} \times 9^{(2n-7)}}{3^{5n}}$ is:

(1) $\frac{1}{3}$ (2) $\frac{9}{13}$

(3) $\frac{1}{9}$ (4) $\frac{2}{3}$

(5) None of these

19. $\frac{(0.6)^0 - (0.1)^{-1}}{\left(\frac{3}{2^3}\right)^{-1} \cdot \left(\frac{3}{2}\right)^3 + \left(-\frac{1}{3}\right)^{-1}}$ is equal to:

(1) $-\frac{3}{2}$ (2) $-\frac{1}{2}$

(3) $\frac{2}{3}$ (4) $\frac{3}{2}$

(5) None of these

20. If $\frac{9^n \left(3^2\right)\left(3^{-n/2}\right)^{-2} - 27}{3^{3m}(2^3)} = \frac{1}{27}$, then:

(l) $m - n - 2 = 0$ (2) $m - n - 1 = 0$

(3) $m - n + 1 = 0$ (4) $m - n + 2 = 0$

(5) None of these

21. The expression ${}_x a(b-c).{}_x b(c-a).{}_x c(a-b)$ simplifies to:

(1) -1 (2) 0

(3) 1 (4) 2

22. If a = (1 - m), b = (m - n) and c = (n - 1), then the expression $(x^a)^n.(x^b)^1.(x^c)^m$ in the simplified form is:

(1) 0 (2) x

(3) x^{-1} (4) 1

(5) None of these

23. If $\left(\sqrt{3}\right)^5 \times (9)^2 = 3^a \times \sqrt[3]{3}$, then α equals:

(1) 2 (2) 3

(3) 4 (4) 5

(5) None of these

24. If $a^{x-3}.a^{y+2} = a^2.a^x$ and $a^x.a^y = a^4$, then:

(1) x = y = 0 (2) x = y = 1

(3) x > y (4) x < y

(5) None of these

25. If $a^{x-2}(a^{2x+2} + a^{1-x}) = a^{-3}(a^9 + a^2)$, then the value of x is:

(1) 0

(2) a fraction

(3) a positive integer

(4) a negative integer

(5) None of these

26. If $a^x = b^y = c^z$ and $b^2 = ac$, then *y* equals?

(1) $\frac{xz}{x+z}$ (2) $\frac{xz}{2(x-z)}$

(3) $\frac{xz}{2(z-x)}$ (4) $\frac{2xz}{(x+z)}$

(5) None of these

27. The value of $\left(\frac{x^a}{x^b}\right)^{(a+b)} \times \left(\frac{x^b}{x^c}\right)^{(b+c)} \times \left(\frac{x^c}{x^a}\right)^{(c+a)}$ is:

(1) 0 (2) x^{abc}

(3) 2 (4) 1

(5) None of these

28. The expression

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

is equal to :

(1) x^{a-b-c} (2) 1

(3) 0 (3) 2

(5) None of these

29. If $x = y^a$, $y = z^b$ and $z = x^c$, then the value of abc is

(1) 4 (2) 3

(3) 2 (4) 1

(5) None of these

30. If $2^X = 3^y = 6^{-z}$, then $\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)$ is equal to:

(1) 0 (2) 1

(3) $\frac{3}{2}$ (4) $-\frac{1}{2}$

(5) None of these

31. If $a^x = b$, $b^y = c$ and $c^z = a$, then the value of xyz is:

(1) 0 (2) 1

(3) $\frac{1}{3}$ (4) $\frac{1}{2}$

(5) None of these

32. If $2^X = 4^y = 8^Z$ and $\frac{1}{2x}+\frac{1}{4y}+\frac{1}{4z}=4$, then the value of x is:

(1) $\frac{7}{16}$ (2) $\frac{7}{32}$

(3) $\frac{7}{48}$ (4) $\frac{3}{4}$

(5) None of these

33. If $\left(\frac{1}{1+a^{n-m}}+\frac{1}{1+a^{m-n}}\right)$ is equal to:

(1) 0 (2) 1

(3) $\frac{1}{2}$ (4) a^{m+n}

(5) None of these

34. If $m = a^x$, $n = a^y$ and $m^y n^x = a^{2/z}$ then, the value of xyz is:

(1) 1 (2) 2

(3) 3 (4) 4

(5) None of these

35. The simplified form of $\frac{3^{7/2}\cdot\sqrt{y^3}}{3^{5/2}\cdot\sqrt{y}}$ is:

(1) $\frac{x^2}{y}$ (2) $\frac{x^3}{y^2}$

(3) $\frac{x^6}{y^3}$ (4) xy

(5) None of these

36. The solution of :-

(a) $x^{x\sqrt{x}} = (x\sqrt{x})^x$ (b) $3^{3x+5}\times 3^{3x+3} = 9$

(c) $4^{X+2} + 2^{2x+1} - 36 = 0$ are respectively:

(1) $\frac{9}{4}, -1 \& \frac{1}{2}$ (2) $\frac{9}{4}, \frac{1}{2} \& -1$

(3) $-1, \frac{1}{2}, \frac{9}{4}$ (4) $-1, \frac{9}{4} \& \frac{1}{2}$

(5) None of these

37. Consider the following statements:

(1) if $a^x = b$, $b^y = c$, $c^z = a$, then xyz = o

(2) if $p = a^x$, $q = a^y$, $(p^y q^x) = a^z$, then xyz = 1

(3) if $x^a = y^b = z^c$ & ab + bc + ca= 0, then xyz = 1.

Of these statements

(1) 1 & 2 are correct

(2) 2 & 3 are correct

(3) Only 1 is correct

(4) 1 & 3 correct

38. Which of the following is the correct statement?

(1) $\sqrt{2}$ is bigger than $\sqrt[3]{3}$

(2) $\sqrt{2}$ is less then $\sqrt[3]{3}$

(3) $\sqrt{2}$ and $\sqrt{3}$ are equal

(4) $\sqrt[3]{2}$ is equal to $\sqrt[4]{3}$

(5) None of these

39. $\dfrac{3^{n+4}-2(2^n)}{2(2^{n+3})}+2^{-3}$ is equat to:

(1) 2^{n+1} (2) $-2^{n+1}+\dfrac{1}{8}$

(3) $\dfrac{9}{8}-2^n$ (4) 1

(5) None of these

40. If pqr = 1, then

$\left(\dfrac{1}{1+p+q^{-1}}+\dfrac{1}{1+q+r^{-1}}+\dfrac{1}{1+r+p^{-1}}\right)$ is equal to:

(1) 0 (2) $\dfrac{1}{pq}$

(3) pq (4) 1

(5) None of these

41. The value of

$\left(\dfrac{x^b}{x^c}\right)^{(b+c-a)}\times\left(\dfrac{x^c}{x^a}\right)^{(c+a-b)}\times\left(\dfrac{x^a}{x^b}\right)^{(a+b-c)}$ is:

(1) x^{abc} (2) x^{a+b+c}

(3) $x^{ab+bc+ca}$ (4) 1

(5) None of these

42. The value of $\left(\dfrac{x^a}{x^b}\right)^{1/ab}\cdot\left(\dfrac{x^b}{x^c}\right)^{1/bc}\cdot\left(\dfrac{x^c}{x^a}\right)^{1/ca}$ is:

(1) 1 (b) 0

(3) $x^{1/abc}$ (4) $x^{1/(ab+bc+ca)}$

(5) None of these

43. If x, y, z are positive real numbers, the value of $\left(\sqrt{x^{-1}y}.\sqrt{y^{-1}}.z\sqrt{z^{-1}x}\right)$ is:

(1) xyz (2) $\dfrac{1}{xyz}$

(3) 1 (4) $\sqrt{xyz}$

(5) None of these

44. $\sqrt{2}$, $\sqrt[3]{4}$ and $\sqrt[4]{6}$ is ascending order are:

(1) $\sqrt{2},\sqrt[3]{4},\sqrt[4]{6}$ (2) $\sqrt[4]{6},\sqrt[3]{4},\sqrt{2}$

(3) $\sqrt{2},\sqrt[4]{6},\sqrt[3]{4}$ (4) $\sqrt[4]{6},\sqrt{2},\sqrt[3]{4}$

(5) None of these

ANSWERS

1.	5	9.	5	17.	3	25.	2	33.	2	41.	4
2.	2	10.	4	18.	3	26.	4	34.	1	42.	1
3.	4	11.	1	19.	1	27.	4	35.	4	43.	3
4.	4	12.	5	20.	5	28.	2	36.	2	44.	3
5.	2	13.	3	21.	3	29.	4	37.	2		
6.	2	14.	3	22.	4	30.	1	38.	2		
7.	3	15.	1	23.	4	31.	2	39.	4		
8.	2	16.	4	24.	4	32.	1	40.	4		