

SURDS AND INDICES

1. The value of $(\sqrt{125})^{1/3}$ 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 $\sqrt{4 + \sqrt[3]{x}} = 4$ 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 $9^x - 10 \cdot 3^x + 9 = 0$ 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 $\frac{9^n (3^2) (3^{-n/2})^{-2} - 27}{3^{3m} (2^3)} = \frac{1}{27}$, then:

- (1) $m - n - 2 = 0$ (2) $m - n - 1 = 0$
(3) $m - n + 1 = 0$ (4) $m - n + 2 = 0$
(5) None of these

21. The expression ${}_x a(b-c) \cdot {}_x b(c-a) \cdot {}_x c(a-b)$ 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 $(x^a)^n \cdot (x^b)^1 \cdot (x^c)^m$ in the simplified form is:

- (1) 0 (2) x
(3) x^{-1} (4) 1
(5) None of these

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

- (1) 2 (2) 3
(3) 4 (4) 5
(5) None of these

24. If $a^{x-3} \cdot a^{y+2} = a^2 \cdot a^x$ and $a^x \cdot a^y = a^4$, 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
(3) 2
(5) None of these

- (2) x^{abc}
(4) 1

- (1) 0
(3) $\frac{1}{2}$
(5) None of these
- (2) 1
(4) a^{m+n}

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}
(3) 0
(5) None of these
- (2) 1
(4) 2

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

- (1) 4
(3) 2
(5) None of these
- (2) 3
(4) 1

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
(3) $\frac{3}{2}$
(5) None of these
- (2) 1
(4) $-\frac{1}{2}$

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

- (1) 0
(3) $\frac{1}{3}$
(5) None of these
- (2) 1
(4) $\frac{1}{2}$

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) $\frac{7}{16}$
(3) $\frac{7}{48}$
(5) None of these
- (2) $\frac{7}{32}$
(4) $\frac{3}{4}$

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

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

- (1) 1
(3) 3
(5) None of these
- (2) 2
(4) 4

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

- (1) $\frac{x^2}{y}$
(3) $\frac{x^6}{y^3}$
(5) None of these
- (2) $\frac{x^3}{y^2}$
(4) xy

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 $xyz = 0$
(2) if $p = a^x$, $q = a^y$, $(p^x q^y) = a^z$, 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 than $\sqrt[3]{3}$

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

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

(5) None of these

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

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

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

(5) None of these

40. If $pqr = 1$, then

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

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

(3) pq (4) 1

(5) None of these

41. The value of

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

(1) x^{abc}

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

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

(4) 1

(5) None of these

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

$$\left(\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x} \right) \text{ is:}$$

(1) xyz

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

(3) 1

(4) $\sqrt{xyz}$

(5) None of these

44. $\sqrt{2}$, $\sqrt[3]{4}$ and $\sqrt[4]{6}$ in 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		



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