Surds and Indices

1. $7\sqrt{7} \times 7^3 \div 7^{-3/2} = 7^{?/2}$

a) 10 b) 12 c) 6 d) 3

2. $256^{2.5} \times 16^{4.5} \div 64^{1.6} = 4^?$

a) 12.4 b) 16.24 c) 14.2 d) 14

3. $2^{x-1} + 2^{x+1} = 2560$, x = ?

a) 10 b) 16 c) 12 d) 13

4. $\frac{(243)^{\frac{x}{5}} \times 3^{2x+1}}{9^x \times 3^{x-1}}$ = ?

a) 7 b) 6 c) 4 d) 9

5. If $2^x = 3^y = 6^{-z}$; then $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ =?

a) 0 b) 1 c) $\frac{3}{2}$ d) $\frac{-1}{2}$

6. If $8^a = 10$, $10^b = 12$, $12^c = 14$, $14^d = 16$, then find the value of abcd

a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{4}{3}$ d) $\frac{5}{3}$

7. What is the simplest value of $\frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}}$

a) $\sqrt{3}(\sqrt{3}-1)$ b) $\sqrt{2}(\sqrt{3}-1)$ c) $\sqrt{6}$ d) $\sqrt{2}$

8. If $\sqrt{2}$ = 1.4142, find the value of $2\sqrt{2} + \sqrt{2} + \frac{1}{2+\sqrt{2}} + \frac{1}{\sqrt{2}-2}$

a) 1.4142 b) 2.8284 c) 28.284 d) 14.142

9. If $x = \frac{2\sqrt{6}}{\sqrt{3}+\sqrt{2}}$, then the value of $\frac{x+\sqrt{2}}{x-\sqrt{2}} + \frac{x+\sqrt{3}}{x-\sqrt{3}}$ =?

a) $\sqrt{3}$ b) $\sqrt{6}$ c) 2 d) $\sqrt{2}$

10. Find the value of $\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$

a) $\sqrt{3}$ b) 0 c) 2 d) $\sqrt{2}$

11. If $2^x = \sqrt[3]{32}$, then x equal to:

a) 5 b) 3 c) $\frac{3}{5}$ d) $\frac{5}{3}$

12. If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then x equal to:

a) 0 b) 2 c) 4 d) 6

13. If abc=1, then $\left(\frac{1}{1+a+b^{-1}} + \frac{1}{1+b+c^{-1}} + \frac{1}{1+c+a^{-1}}\right)$ =?

a) 0 b) 1 c) $\frac{1}{ab}$ d) ab

14. Number of prime factors in $\frac{6^{12}\times(35)^{28}\times(15)^{16}}{(14)^{12}\times(21)^{11}}$ is:

a) 56 b) 66 c) 112 d) None of these

15. Number of prime factors in $(216)^{\frac{3}{5}} \times (2500)^{\frac{2}{5}} \times (300)^{\frac{1}{5}}$ is:

a) 6 b) 7 c) 8 d) None of these

16. Given that $10^{0.48} = x, 10^{0.70} = y$ *and* $x^z = y^2$, then the value of z is close to:

a) 1.45 b) 1.88 c) 2.9 d) 3.7

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

a) 0 b) 2 c) 3 d) 4

18. If $\sqrt{3}^5 \times 9^2 = 3^n \times 3\sqrt{3}$, then the value of n is:

a) 2 b) 3 c) 4 d) 5

19. If $\sqrt{2^n} = 64$, then the value of n is:

a) 2 b) 4 c) 6 d) 12

20. If $5\sqrt{5} \times 5^3 \div 5^{\frac{-3}{2}} = 5^{a+2}$, then the value of a is:

a) 4 b) 5 c) 6 d) 8

21. $2^{2n-1} = \frac{1}{8^{n-3}}$ then the value of n is:

a) 3 b) 2 c) 0 d) -2

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

a) ½ b) 1 c) 2 d) 7/2

23. $(25)^{7.5} \times (5)^{2.5} \div (125)^{1.5} = 5^?$

a) 8.5 b) 13 c) 16 d) 17.5

24. $(18)^{3.5} \div (27)^{3.5} \times 6^{3.5} = 2^?$

a) 3.5 b) 4.5 c) 6 d) 7

25. $(64)^{\frac{-1}{2}} - (-32)^{\frac{-4}{5}} = ?$

a) 1/8 b) 3/8 c) 1/16 d) 3/16

26. $(17)^{3.5} \times (17)^? = (17)^8$

a) 2.29 b) 2.75 c) 4.25 d) 4.5

27. $(0.04)^{-1.5}$ =?

a) 25 b) 125 c) 250 d) 625

28. $(1000)^7 \div 10^{18}$ =?

a) 10 b) 100 c) 1000 d) 10000

29. $(2.4 \times 10^3) \div (8 \times 10^{-2})$ =?

a) $3 \times (10)^{-5}$ b) $3 \times (10)^4$ c) $3 \times (10)^5$ d) 30

30. The value of $\frac{1}{(216)^{\frac{-2}{3}}} + \frac{1}{(256)^{\frac{-3}{4}}} + \frac{1}{(32)^{\frac{-1}{3}}}$

a) 102 b) 105 c) 107 d) 109

Answers

1 – b	2 - c	3 - a	4 - d	5 - a	6 - c	7 - b	8 - b	9 - c	10 - b
11 - d	12 - c	13 - b	14 - b	15 - b	16 - c	17 - c	18 - d	19 - d	20 - a
21 - b	22 - c	23 - b	24 - d	25 - c	26 - d	27 - b	28 - c	29 - b	30 - a