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

   a) 7　　　　　　　b) 6　　　　　c) 4　　　　　d) 9

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

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

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

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

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

   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 $2\sqrt{2} + \sqrt{2} + \dfrac{1}{2+\sqrt{2}} + \dfrac{1}{\sqrt{2}-2}$

   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 $\dfrac{1}{(216)^{\frac{-2}{3}}} + \dfrac{1}{(256)^{\frac{-3}{4}}} + \dfrac{1}{(32)^{\frac{-1}{3}}}$

    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