Assignment

Indices

Basic Level

1. $a^{m\log_a n} =$

(a) a^{mn} (b) m^n (c) n^m (d) None of these

2. If $(a^m)^n = a^{m^n}$, then the value of 'm' in terms of 'n' is

(a) n (b) $n^{1/m}$ (c) $n^{1/(n-1)}$ (d) None of these

3. $(x^5)^{1/3}(16x^3)^{2/3}\left(\frac{1}{4}x^{4/9}\right)^{-3/2} =$

(a) $(x/4)^3$ (b) $(4x)^3$ (c) $8x^3$ (d) None of these

4. If $a^{1/x} = b^{1/y} = c^{1/z}$ and $b^2 = ac$ then $x + z =$

(a) y (b) $2y$ (c) $2xyz$ (d) None of these

5. If $a^x = bc, b^y = ca, c^z = ab$, then xyz =

(a) 0 (b) 1 (c) $x+y+z$ (d) $x+y+z+2$

6. If $a^x = (x+y+z)^y, a^y = (x+y+z)^z$, $a^z = (x+y+z)^x$, then

(a) $x = y = z = a/3$ (b) $x+y+z = a/3$ (c) $x+y+z = 0$ (d) None of these

7. If $a^{x-1} = bc, b^{y-1} = ca, c^{z-1} = ab$, then $\sum(1/x) =$

(a) 1 (b) 0 (c) abc (d) None of these

8. If $\frac{(2^{n+1})^m(2^{2n})2^n}{(2^{m+1})^n 2^{2m}} = 1$, then m =

(a) 0 (b) 1 (c) n (d) $2n$

9. If $x^y = y^x$, then $(x/y)^{(x/y)} = x^{(x/y)-k}$, where $k =$

(a) 0 (b) 1 (c) –1 (d) None of these

10. If $x^{x\sqrt[3]{x}} = (x.\sqrt[3]{x})^x$, then x =

(a) 1 (b) –1 (c) 0 (d) 64/27

11. If $a^x = b^y = (ab)^{xy}$, then $x + y =$

(a) 0 (b) 1 (c) xy (d) None of these

12. If $x = 2^{1/3} - 2^{-1/3}$, then $2x^3 + 6x =$

(a) 1 (b) 2 (c) 3 (d) None of these

13. If $x = 2 + 2^{2/3} + 2^{1/3}$, then the value of $x^3 - 6x^2 + 6x$ is

(a) 3 (b) 2 (c) 1 (d) None of these

14. Solution of the equation $(x)^{x\sqrt{x}} = (x\sqrt{x})^x$ are

(a) 9/4 (b) 1 (c) –1 (d) 0

15. If $5^{x-1} + 5.(0.2)^{x-2} = 26$, then x may have the value

(a) 25 (b) 1 (c) 3 (d) None of these

Advance Level

16. $\sum \frac{1}{1 + x^{a-b} + x^{a-c}} =$

(a) 1 (b) –1 (c) 0 (d) None of these

17. Let $\frac{7}{2^{1/2} + 2^{1/4} + 1} = A + B.2^{1/4} + C.2^{1/2} + D.2^{3/4}$, then

(a) $A = 1$ (b) $B = 3$ (c) $C = 2$ (d) $D = 1$

18. Solution of the equation $4.9^{x-1} = 3\sqrt{(2^{2x+1})}$ has the solution

(a) 3 (b) 2 (c) 3/2 (d) 2/3

19. Solution of the equation $9^x - 2^{x+\frac{1}{2}} = 2^{x+\frac{3}{2}} - 3^{2x-1}$

(a) $\log_9(9/\sqrt{8})$ (b) $\log_{(9/2)}(9/\sqrt{8})$ (c) $\log_e(9/\sqrt{8})$ (d) None of these

Surds

Basic Level

20. If $a > 0$, then $\sqrt{a + \sqrt{a + \sqrt{a + ...\infty}}}$ is

(a) $\frac{1}{2}\sqrt{(4a-1)}$ (b) $\frac{1}{2}[1 + \sqrt{(4a+1)}]$ (c) $\frac{1}{2}[1 - \sqrt{(4a-1)}]$ (d) $\frac{1}{2}[1 \pm \sqrt{(4a+1)}]$

21. $\frac{[4 + \sqrt{(15)}]^{3/2} + [4 - \sqrt{(15)}]^{3/2}}{[6 + \sqrt{(35)}]^{3/2} - [6 - \sqrt{(35)}]^{3/2}} =$

(a) 1 (b) 7/13 (c) 13/7 (d) None of these

22. If $x = \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}}, y = \frac{\sqrt{5} - \sqrt{2}}{\sqrt{5} + \sqrt{2}}$, then $3x^2 + 4xy - 3y^2 =$

(a) $\frac{1}{3}[56\sqrt{10} - 12]$ (b) $\frac{1}{3}[56\sqrt{10} + 12]$ (c) $\frac{1}{3}[56 + 12\sqrt{10}]$ (d) None of these

23. $\frac{12}{3 + \sqrt{5} - 2\sqrt{2}} =$

(a) $1 + \sqrt{5} + \sqrt{(10)} + \sqrt{2}$ (b) $1 + \sqrt{5} - \sqrt{(10)} + \sqrt{2}$ (c) $1 + \sqrt{5} + \sqrt{10} - \sqrt{2}$ (d) $1 - \sqrt{5} - \sqrt{2} + \sqrt{(10)}$

24. $\frac{1}{\sqrt{(11-2\sqrt{30})}}-\frac{3}{\sqrt{(7-2\sqrt{10})}}-\frac{4}{\sqrt{(8+4\sqrt{3})}}=$

(a) 0 (b) −1 (c) 1 (d) None of these

25. $\frac{\sqrt{(5/2)}+\sqrt{(7-3\sqrt{5})}}{\sqrt{(7/2)}+\sqrt{(16-5\sqrt{7})}}=$

(a) Rational (b) Surd (c) Multiple of $\sqrt{7}$ (d) None of these

26. $\frac{\sqrt{2}}{\sqrt{(2+\sqrt{3})}-\sqrt{(2-\sqrt{3})}}=$

(a) 0 (b) 1 (c) $\sqrt{2}$ (d) $1/\sqrt{2}$

27. $\frac{4}{1+\sqrt{2}-\sqrt{3}}=$

(a) $2+\sqrt{2}+\sqrt{6}$ (b) $1+\sqrt{2}+\sqrt{3}$ (c) $3+\sqrt{2}+\sqrt{3}$ (d) None of these

28. $\frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}}-\frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}+\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}=$

(a) $5\sqrt{2}$ (b) $3\sqrt{2}$ (c) $2\sqrt{3}$ (d) 0

29. If $\frac{4+3\sqrt{3}}{\sqrt{(7+4\sqrt{3})}}=a+\sqrt{b}$, then $(a,b)=$

(a) (12,1) (b) (1, 12) (c) (−1, 12) (d) (−12, 1)

30. The rationalising factor of $2\sqrt{3}-\sqrt{7}$ is

(a) $\sqrt{3}+\sqrt{7}$ (b) $2\sqrt{3}+\sqrt{7}$ (c) $\sqrt{3}+2\sqrt{7}$ (d) None of these

31. The square root of $134+\sqrt{(6292)}$ is

(a) $21+\sqrt{(13)}$ (b) $11+\sqrt{(13)}$ (c) $13+\sqrt{(11)}$ (d) $13+\sqrt{(21)}$

32. The value of $\sqrt{[12-\sqrt{(68+48\sqrt{2})}]}=$

(a) $2+\sqrt{2}$ (b) $2-\sqrt{2}$ (c) $\sqrt{2}-1$ (d) None of these

33. The square root of $\sqrt{(50)}+\sqrt{(48)}$ is

(a) $2^{1/4}(3+\sqrt{2})$ (b) $2^{1/4}(\sqrt{3}+2)$ (c) $2^{1/4}(2+\sqrt{2})$ (d) $2^{1/4}(\sqrt{3}+\sqrt{2})$

34. $\sqrt{(3+\sqrt{5})}-\sqrt{(2+\sqrt{3})}=$

(a) $\sqrt{(5/2)}+\sqrt{(3/2)}$ (b) $\sqrt{(5/2)}-\sqrt{(3/2)}$ (c) $\sqrt{(5/2)}-\sqrt{(1/2)}$ (d) $\sqrt{(3/2)}-\sqrt{(1/2)}$

35. The value of $\sqrt{[12\sqrt{5}+2\sqrt{(55)}]}$ is

(a) $5^{1/2}[\sqrt{(11)}+1]$ (b) $5^{1/2}[\sqrt{(11)}-1]$ (c) $5^{1/4}[\sqrt{(11)}+1]$ (d) $5^{1/4}[\sqrt{(11)}-1]$

36. The cube root of $9\sqrt{3}+11\sqrt{2}$ is

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

37. If $x+\sqrt{(x^2+1)}=a$, then x =

(a) $\frac{1}{2}(a+1/a)$ (b) $\frac{1}{2}(a-1/a)$ (c) $(a+a^{-1})$ (d) None of these

38. If $x=\sqrt{7}+\sqrt{3}$ and $xy=4$, then x^4+y^4 =

(a) 400 (b) 368 (c) 352 (d) 200

39. If $x=2+\sqrt{3}, xy=1$, then $\frac{x}{\sqrt{2}+\sqrt{x}}+\frac{y}{\sqrt{2}-\sqrt{y}}=$

(a) $\sqrt{2}$ (b) $\sqrt{3}$ (c) 1 (d) None of these

40. If $x=3-\sqrt{5}$, then $\frac{\sqrt{x}}{\sqrt{2}+\sqrt{(3x-2)}}=$

(a) 5 (b) $\sqrt{5}$ (c) $1/5$ (d) $1/\sqrt{5}$

41. If $a=\sqrt{(21)}-\sqrt{(20)}$ and $b=\sqrt{(18)}-\sqrt{(17)}$, then

(a) $a=b$ (b) $a+b=0$ (c) $a>b$ (d) $a<b$

42. Solution of the equation $\sqrt{(x+10)}+\sqrt{(x-2)}=6$ are

(a) 0 (b) 6 (c) 4 (d) None of these

Advance Level

43. Let $u_n=\frac{1}{\sqrt{5}}\left[\left(\frac{1+\sqrt{5}}{2}\right)^n-\left(\frac{1-\sqrt{5}}{2}\right)^n\right]$, $n=0,1,2,...$ then

(a) $u_{n+1}=u_n+u_{n-1}$ (b) $u_{2n-1}=u_n^2+u_{n-1}^2$ (c) $u_{n+2}=u_n+u_{n+1}$ (d) None of these

44. $\sqrt{[6+2\sqrt{3}+2\sqrt{2}+2\sqrt{6}]}-1/\sqrt{(5+2\sqrt{6})}=$

(a) 1 (b) –1 (c) 0 (d) None of these

45. $\sqrt{[x+2\sqrt{(x-1)}]}+\sqrt{[x-2\sqrt{(x-1)}]}=$

(a) 2, if $1\le x\le 2$ (b) 2, if $x>2$ (c) $2\sqrt{(x-1)}$, if $1\le x\le 2$ (d) $2\sqrt{(x-1)}$, if $x>2$

***