REAL NUMBERS

1. If $2^{x+3} = 8^{x+3}$ then x = _____ (March 2009)
2. $(16)^{1.25}$ =_____ (March 2009)
3. $\underset{x\to\infty}{\text{Lt}} \frac{1}{x} =$ _____ (March 2009)
4. $(16)^{0.5}$ = _____ (March 2008)
5. $(64)^x = 2\sqrt{2}$ then x = _____ (March 08)
6. The limiting position of secant of a circle is _____ (March 2008)
7. If $\sqrt{x^a} = x^{\frac{2}{3}}$ then a = _____ (March 2008)
8. If $a^x = b$; $b^y = c$, $c^z = a$ then the value of xyz = _____ (March 2008), (March 2009)
9. $\sum_{n=1}^{3}(n^2+1) =$_____ (March 2009)
10. If $(x^{2/3})^p = x^2$ then the value of p is ____
11. $\underset{x\to\infty}{\text{Lt}} \frac{2x+3}{3x+5} =$ _____ (June 2009, 10)
12. $a \neq 0$ and if p + q + r = 0 then $a^{3p+3q+3r}$ = _____ (June 2007)
13. If $x + \frac{1}{x} = 4$ then $x - \frac{1}{x} =$ _____(March'10)
14. If x = –3 then $|x^2 - 20|$ = _____ (March'10)
15. $\sum_{i=0}^{3} 4^i =$ _____ (June 2010)
16. If $(64)^x = \frac{1}{(256)^y}$ then 3x = _____
17. If $x^{\frac{3}{2}} = 0.027$ then x = _____
18. If $a^{(a\sqrt{a})} = (a\sqrt{a})^a$ then a = _____
19. The rationalising factor of $a^{\frac{1}{3}} + b^{\frac{1}{3}}$ is _____
20. $\underset{n\to\infty}{\text{Lt}} \frac{1^3+2^3+3^3+---+n^3}{n^4} =$ _____
21. $\underset{x\to 0}{\text{Lt}} \frac{x^2+5x}{x} =$ _____
22. $\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}} =$ _____
23. $\underset{x\to -2}{\text{Lt}} \frac{x^3-2x+2}{2x^2+3x+5} =$ _____
24. $\left(x^{\frac{1}{4}} + y^{\frac{1}{4}}\right)\left(x^{\frac{1}{2}} - x^{\frac{1}{4}}y^{\frac{1}{4}} + y^{\frac{1}{2}}\right) =$ _____
25. If $3^{5x+2} = (27)^4$ then x = _____
26. If $\sqrt[3]{x} + \sqrt[3]{y} + \sqrt[3]{z} = 0$, then $(x + y + z)^3$ = _____
27. The limit of the sum $1 + \frac{1}{3} + \frac{1}{3^2} + ...\alpha$ is _____
28. The value of $(32)^{\frac{-4}{5}}$ = _____
29. $\left(\frac{a^p}{a^q}\right)^{p+q} \cdot \left(\frac{a^q}{a^r}\right)^{q+r} \cdot \left(\frac{a^r}{a^p}\right)^{r+p}$ = _____
30. $\underset{x\to a}{\text{Lt}} \frac{x^{-5}-a^{-5}}{x^3-a^3} =$ _____
31. If x = –8 then |x – 1| = _____
32. $\frac{a-b}{\sqrt{a}-\sqrt{b}} =$ _____
33. If |2x – 3| = 7 then x = _____
34. The solution of $|2x - 3| \leq 7$ is _____
35. $\underset{x\to 4}{\text{Lt}} \frac{x^2-16}{x-4} =$ _____
36. If $a^{x-1} = bc$, $b^{y-1} = ac$, $e^{z-1} = ab$ then
    xy + yz + zx = _____
37. If $\sqrt{\sqrt{3^x}} = 81$ then x = _____

38. If $\Sigma n = 10$ then $\Sigma n^3 =$ _____

39. $x^{\frac{3}{5}} x^{\frac{4}{5}} x^{\frac{-2}{5}} =$ _____

40. $\Sigma n^3 =$ _____

41. If $\Sigma n = 66$ then n = _____

42. $a^{2/3}[a^{1/3}(a^{1/4})^4] =$ _____

43. If $\left(\frac{3^x}{9}\right)^2 = \frac{1}{\sqrt{3}}$ then x = _____

44. $\underset{x\to 0}{\text{Lt}} \frac{(1+x)^4 - 1}{(1+x)^3 - 1} =$ _____

45. If $5x - \sqrt{5} = 15 - \sqrt{5}$ then $x^2 =$ _____

KEY

1. x = -3	2. 32	3. zero	4. 4	5. 1/4	6. Tangent	7. 4/3
8. 1	9. 17	10. P = 3	11. 2/3	12. 1	13. $2\sqrt{3}$	14. 11
15. 85	16. -4Y	17. 0.09	18. 9/4	19. $(a^{2/3} - a^{1/3}b^{1/3} + b^{2/3})$		
20. 1/4	21. 5	22. 1	23. -2/7	24. $(x^{3/4} + y^{3/4})$	25. 2	
26. 27xyz	27. 3/2	28. 1/16	29. 1	30. $\frac{-5}{3}a^{-8}$ (or) $\frac{-5}{3a^8}$	31. 9	
32. $\sqrt{a} + \sqrt{b}$	33. 5 (or) -2	34. $-2 \le x \le 5$	35. 8	36. xyz	37. 16	38. 100
39. x	40. $(\Sigma n)^2$	41. 11	42. a^2	43. 7/4	44. 4/3	45. 9

Important Questions

4 Marks

1. If lmn = 1 show that $\Sigma \frac{1}{1+l+m^{-1}} = 1$?
2. If a+b+c = 0 show that
   $x^{a^2b^{-1}c^{-1}} . x^{a^{-1}b^2c^{-1}} . x^{a^{-1}b^{-1}c^2} = x^3$?
3. If $y = \sqrt[3]{3} + \frac{1}{\sqrt[3]{3}}$ show that $3y^3 - 9y = 10$?
4. If $a^{x-1} = bc$, $b^{y-1} = ca$, $c^{z-1} = ab$, Prove that xy+yz+zx = xyz?
5. Evaluate $\underset{x\to a}{\text{Lt}} \frac{\sqrt{x+a} - \sqrt{2a}}{x-a}$?

2 Marks

1. Solve $|4x + 1| \le 7$?
2. If $(64)^x = \frac{1}{(256)^y} = \sqrt[2]{2}$ then show that
   3x+4y = 0?
3. Evaluate $\underset{x\to m}{\text{Lt}} \frac{x^p - m^p}{x^q - m^q}$?
4. Evaluate $\underset{x\to 0}{\text{Lt}} \frac{\sqrt{1+x+x^2} - 1}{x}$?
5. If $a = x + \sqrt{x^2+1}$ then show that
   $x = \frac{1}{2}(a - a^1)$?
6. If $a^x = b$, $b^y = c$, $c^z = a$ show that xyz = 1?

1 Mark

1. If $\left(x\frac{2}{3}\right)^P = x^2$ find 'P'?
2. Evaluate $\frac{x^{\frac{3}{2}} - a^{\frac{3}{2}}}{x-a}$?
3. Simplify $a^{x(y-z)} . a^{y(z-x)} . a^{z(x-y)}$?
4. Evaluate $\underset{x\to 0}{\text{Lt}} \frac{x^2+5x}{x}$?
5. Evalute $\underset{x\to\infty}{\text{Lt}} \frac{8x+4}{2x+6}$?
6. Solve $2^{x+3} = 4^{x+1}$?
7. If $a^x = b$, $b^y = c$, $c^z = a$ show that xyz = 1?

8. Simplify $\left(a^{\frac{1}{3}} - b^{\frac{1}{3}}\right)\left(a^{\frac{2}{3}} + a^{\frac{1}{3}}b^{\frac{1}{3}} + b^{\frac{2}{3}}\right)$?

9. Simplify $x^{\frac{b-c}{bc}} . x^{\frac{c-a}{ca}} . x^{\frac{a-b}{ab}}$. ?