PERSONAL PAPER

PANDEYPUR

REAL NUMBER QUESTION BANK

Class 09 - Mathematics

1. The value of $\sqrt[4]{(64)^{-2}}$ is **[1]**

   a) $\frac{1}{2}$ b) $\frac{1}{8}$

   c) $\frac{1}{16}$ d) $\frac{1}{4}$

2. After simplification, $\frac{13^{1/5}}{13^{1/3}}$ is **[1]**

   a) $13^{8/15}$ b) $13^{2/15}$

   c) $13^{-2/15}$ d) $13^{1/3}$

3. The value of $(0.00032)^{\frac{-2}{5}}$ is **[1]**

   a) 1 b) 0

   c) 5 d) 25

4. The number obtained on rationalising the denominator of $\frac{1}{\sqrt{7}-2}$ is **[1]**

   a) $\frac{\sqrt{7}+2}{45}$ b) $\frac{\sqrt{7}-2}{3}$

   c) $\frac{\sqrt{7}+2}{5}$ d) $\frac{\sqrt{7}+2}{3}$

5. A rational number between -3 and 3 is **[1]**

   a) 0 b) -3.4

   c) 1.101100110001 ... d) -4.3

6. If $9^{x+2} = 240 + 9^x$, then x = **[1]**

   a) 0.2 b) 0.5

   c) 0.4 d) 0.1

7. The value of $0.\overline{2}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$ is **[1]**

   a) $\frac{2}{9}$ b) $\frac{1}{5}$

   c) $\frac{2}{5}$ d) $\frac{1}{8}$

8. The value of $7^{\frac{1}{2}} \cdot 8^{\frac{1}{2}}$ is **[1]**

   a) $(28)^{1/2}$ b) $(56)^{1/2}$

   c) $(14)^{1/2}$ d) $(42)^{1/2}$

9. The value of 1.9999……. in the form $\frac{p}{q}$, where 'p' and 'q' are integers and q $\neq$ 0, is **[1]**

   a) $\frac{1999}{1000}$ b) $\frac{19}{10}$

   c) 2 d) $\frac{1}{9}$

10. The rationalisation factor of $\frac{1}{2\sqrt{3}-\sqrt{5}}$ is **[1]**

a) $(\sqrt{3}+\sqrt{5})$ b) $\sqrt{12}+\sqrt{5}$

c) $\sqrt{5}-2\sqrt{3}$ d) $\sqrt{3}+2\sqrt{5}$

11. The simplest rationalisation factor of $(2\sqrt{2}-\sqrt{3})$ is **[1]**

a) $\sqrt{2}+\sqrt{3}$ b) $2\sqrt{2}+\sqrt{3}$

c) $2\sqrt{2}+3$ d) $\sqrt{2}-\sqrt{3}$

12. The simplest form of $0.5\overline{7}$ is **[1]**

a) $\frac{26}{45}$ b) $\frac{57}{99}$

c) $\frac{57}{100}$ d) none of these

13. An irrational number between $\frac{1}{7}\ and\ \frac{2}{7}$ is **[1]**

a) $\sqrt{\frac{1}{7}\times\frac{2}{7}}$ b) none of these

c) $\left(\frac{1}{7}\times\frac{2}{7}\right)$ d) $\frac{1}{2}\left(\frac{1}{7}+\frac{2}{7}\right)$

14. An irrational number between $\sqrt{2}$ and $\sqrt{3}$ is **[1]**

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

c) $5^{1/4}$ d) $6^{1/4}$

15. If $\sqrt{2}=1.4142$, then $\sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}}$ is equal to **[1]**

a) 0.1718 b) 5.8282

c) 0.4142 d) 2.4142

16. If x = $\sqrt{5}$+ 2, then x - $\frac{1}{x}$ equals **[1]**

a) 2 b) 4

c) $2\sqrt{5}$ d) $\sqrt{5}$

17. The sum of $0.\overline{3}$ and $0.\overline{4}$ is **[1]**

a) $\frac{7}{11}$ b) $\frac{7}{99}$

c) $\frac{7}{10}$ d) $\frac{7}{9}$

18. If $\sqrt{5}$ = 2.236, then $\frac{1}{\sqrt{5}}$ **[1]**

a) 44.72 b) 0.4472

c) 0.04472 d) 4.472

19. If g = $t^{\frac{2}{3}}+4t^{\frac{-1}{2}}$, what is the value of g when t = 64? **[1]**

a) $\frac{31}{2}$ b) $\frac{257}{16}$

c) $\frac{33}{2}$ d) 16

20. Which of the following is rational: **[1]**

a) $\sqrt{3}$ b) $\frac{4}{0}$

c) $\frac{0}{4}$ d) π

21. If $x = \frac{2}{3+\sqrt{7}}$, then (x - 3)^2 **[1]**

a) 7 b) 3

c) 6 d) 1

22. The value of $\left[(81)^{\frac{1}{2}}\right]^{\frac{1}{2}}$ is **[1]**

a) -3 b) 9

c) $\frac{1}{3}$ d) 3

23. The simplest rationalising factor of $\sqrt{3}+\sqrt{5}$,is **[1]**

a) $\sqrt{3}+\sqrt{5}$ b) $\sqrt{3}-\sqrt{5}$

c) $\sqrt{3}-5$ d) $3-\sqrt{5}$

24. The value of $(243)^{1/5}$ is **[1]**

a) 5 b) -3

c) $\frac{1}{3}$ d) 3

25. The value of {2 - 3 (2 - 3)^3}^{3}, is: **[1]**

a) 1 b) 125

c) -125 d) $\frac{1}{5}$

26. Solve the equation: $2^{x-3} = 4^{x-1}$. **[2]**

27. If (x - 1)^3 = 8, what is the value of (x + 1)^2 ? **[2]**

28. If x = 2 + $\sqrt{3}$, find the value of x^2 + $\frac{1}{x^2}$. **[2]**

29. Evaluate by removing the radical sign and negative indices wherever it occurs: $(64)^{\frac{1}{3}}$. **[2]**

30. Find the value of x, if $5^{x-3} \times 3^{2x-8} = 225$. **[2]**

31. Simplify the following: $\sqrt[5]{16} \times \sqrt[5]{2}$. **[2]**

32. Simplify: $\frac{(2\sqrt{45}+3\sqrt{20})}{2\sqrt{5}}$. **[2]**

33. Find the product of $(8+3\sqrt{2})$ and $(8-3\sqrt{2})$. **[2]**

34. Simplify $3^{3/4} \times 3^{1/4}$. **[2]**

35. Simplify the following expression: (5 + $\sqrt{7}$) (5 - $\sqrt{7}$). **[2]**

36. Simplify: $\frac{\sqrt{25}}{\sqrt[3]{64}} + \left(\frac{256}{625}\right)^{-1/4} + \frac{1}{\left(\frac{64}{125}\right)^{2/3}}$ **[3]**

37. If $\sqrt{2}$=1.4142, find the value of $\sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}}$. **[3]**

38. If $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ find the value of x^2 + y^2 + xy. **[3]**

39. Simplify: $(256)^{-\left(4^{-\frac{3}{2}}\right)}$. **[3]**

40. If $a = 2+\sqrt{3}$, then find the value of $a - \frac{1}{a}$. **[3]**

41. Find the value of $\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$ **[3]**

42. Rationalise: $\frac{1}{\sqrt{7}+\sqrt{3}-\sqrt{2}}$. **[3]**

43. Rationalize the denominators of $\frac{1}{\sqrt{7}-2}$ **[3]**

44. If $a = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $b = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, then find the value of a^2 - b^2. **[3]**

45. Simplify the following by rationalizing the denominator : $\frac{\sqrt{5}-2}{\sqrt{5}+2}-\frac{\sqrt{5}+2}{\sqrt{5}-2}$ **[3]**

46. Simplify$3\sqrt[3]{250}+7\sqrt[3]{16}-4\sqrt[3]{54}$ **[3]**

47. Solve the equation for x: $3^{2x+4}+1=2\times 3^{x+2}$ **[3]**

48. Find the values of a and b in each of $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}=a-b\sqrt{6}$ **[3]**

49. Simplify the following by rationalizing the denominator: $\frac{4+\sqrt{5}}{4-\sqrt{5}}+\frac{4-\sqrt{5}}{4+\sqrt{5}}$ **[3]**

50. Express in the form of $\frac{p}{q}$:$0.\overline{38}+1.\overline{27}$ **[3]**

51. Write the following in the descending order of magnitude. $\sqrt[3]{2},\sqrt{3},\sqrt[6]{5}$. **[5]**

52. If $a=\frac{3+\sqrt{5}}{2}$, then find the value of $a^2+\frac{1}{a^2}$. **[5]**

53. If $a=\frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and $b=\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$,,show that $3a^2+4ab-3b^2=4+\frac{56}{3}\sqrt{10}$. **[5]**

54. If $a=\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $a^2 + b^2 - 5ab$. **[5]**

55. If $x=\frac{5-\sqrt{3}}{5+\sqrt{3}}$ and $y=\frac{5+\sqrt{3}}{5-\sqrt{3}}$,show that $x-y=-\frac{10\sqrt{3}}{11}$. **[5]**

56. Represent each of the numbers $\sqrt{5},\sqrt{6}$ and $\sqrt{7}$ the real line. **[5]**

57. If x is a positive real number and exponents are rational numbers, simplify **[5]**
$\left(\frac{x^b}{x^c}\right)^{b+c-a}\cdot\left(\frac{x^c}{x^a}\right)^{c+a-b}\cdot\left(\frac{x^a}{x^b}\right)^{a+b-c}$.

58. If $a=\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $b=\frac{\sqrt{2}-1}{\sqrt{2}+1}$, then find the value of $a^2 + b^2 - 4ab$. **[5]**

59. If $\frac{9^n\times 3^2\times\left(3^{-n/2}\right)^{-2}-(27)^n}{3^{3m}\times 2^3}=\frac{1}{27}$, prove that m - n = 1. **[5]**

60. Simplify: $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}}-\frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}}-\frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$. **[5]**