

► Choose the right answer from the given options. [1 Marks Each]

[10]

1. Choose the rational number which does not lie between $-\frac{2}{3}$ and $-\frac{1}{5}$.
 (A) $-\frac{1}{4}$ (B) $-\frac{7}{20}$ (C) $\frac{3}{10}$ (D) $-\frac{3}{10}$
2. If $8 = t^{\frac{2}{3}} + 4t^{-\frac{1}{2}}$, What is the value of g when t = 64?
 (A) $\frac{31}{2}$ (B) $\frac{33}{2}$ (C) 16 (D) $\frac{257}{16}$
3. The value of $(\frac{81}{16})^{-\frac{3}{4}} \times \{(\frac{25}{9})^{-\frac{3}{2}} \div (\frac{5}{2})^{-3}\}$ is:
 (A) 2 (B) 3 (C) 1 (D) 4
4. If a, b, c are positive real numbers, then $\sqrt{a^{-1}b} \times \sqrt{b^{-1}c} \times \sqrt{c^{-1}a}$ is equal to
 (A) 1 (B) abc (C) $\sqrt{abc}$ (D) $\frac{1}{abc}$
5. $(\frac{125}{216})^{-\frac{1}{3}} =$
 (A) $\frac{6}{5}$ (B) $\frac{5}{6}$ (C) 125 (D) 216
6. The value of $\sqrt{5+2\sqrt{6}}$, is:
 (A) $\sqrt{3} - \sqrt{2}$ (B) $\sqrt{3} + \sqrt{2}$ (C) $\sqrt{5} + \sqrt{6}$ (D) None of these
7. The decimal expansion that a rational number cannot have is:
 (A) 0.2528 (B) 0.25 (C) 0.2528 (D) 0.5030030003
8. The value of $\frac{1}{\sqrt{8}-3\sqrt{2}}$ is:
 (A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$ (C) $-\frac{1}{\sqrt{2}}$ (D) $-\sqrt{2}$
9. The value of $\frac{\frac{9^{\frac{1}{3}} \times 27^{\frac{1}{2}}}{3^{\frac{1}{6}} \times 3^{\frac{1}{3}}}}$ is:
 (A) 27 (B) 1 (C) 3 (D) 9
10. The value of $\sqrt{p^{-1}q} \cdot \sqrt{q^{-1}r} \cdot \sqrt{r^{-1}p}$ is:
 (A) -1 (B) 0 (C) 1 (D) 2

► Answer the following short questions. [2 Marks Each]

[8]

11. Simplify $\frac{\sqrt{13}-\sqrt{11}}{\sqrt{13}+\sqrt{11}} + \frac{\sqrt{13}+\sqrt{11}}{\sqrt{13}-\sqrt{11}}$
12. Find rational numbers a and b such that:
 $\frac{2-\sqrt{5}}{2+\sqrt{5}} = a\sqrt{5} + b$
13. If $a = 3 - 2\sqrt{2}$, find the value of $a^2 - \frac{1}{a^2}$.
14. Locate $\sqrt{8}$ on the number line.

► Answer the following questions. [3 Marks Each]

[12]

15. If $x = \frac{5-\sqrt{3}}{5+\sqrt{3}}$ and $y = \frac{5+\sqrt{3}}{5-\sqrt{3}}$, show that $x - y = -\frac{10\sqrt{3}}{11}$.
16. Find the values of a and b if:
 $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$
17. If $x = \frac{1}{2-\sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$.
18. Prove that:
 $\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1$
