LEVEL-I

[SINGLE CORRECT CHOICE TYPE]

1. The ratio of (2x – y) to (x + y) is $\frac{2}{3}$. Then $\frac{x}{y}$ is

(A) $\frac{2}{3}$ (B) $\frac{3}{4}$ (C) $\frac{5}{4}$ (D) 5

2. If $x + y = a$ and $x^2 + y^2 = b$, then the value of $(x^3 + y^3)$, is

(A) ab (B) $a^2 + b$ (C) $a + b^2$ (D) $\frac{3ab - a^3}{2}$

3. If $x = 3 - \sqrt{8}$, then $x^2 + \frac{1}{x^2}$ is equal to

(A) 6 (B) 34 (C) 102 (D) 110

4. If $(a^2 + b^2)^3 = (a^3 + b^3)^2$ and $ab \neq 0$ then the numerical value of $\frac{a}{b} + \frac{b}{a}$ is equal to

(A) $\frac{3}{2}$ (B) $\frac{2}{3}$ (C) 1 (D) $\frac{4}{9}$

5. Solution set of the equation $3^{2x^2} - 2.3^{x^2+x+6} + 3^{2(x+6)} = 0$ is

(A) {–3, 2} (B) {6, –1} (C) {–2, 3} (D) {1, – 6}

6. The expression $\sqrt{(28 + 10\sqrt{3})} + \sqrt{(28 - 10\sqrt{3})}$ simplifies to

(A) 10 (B) 12 (C) $2\sqrt{3}$ (D) 5

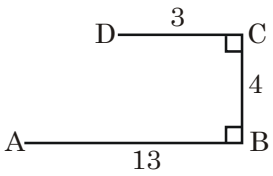
7. Unit digit of $3^8 + 7^8 + 5^8$ is

(A) 1 (B) 7 (C) 6 (D) 0

8. If $4x^4 - (a-1)x^3 + ax^2 - 6x + 1$ is divisible by (2x – 1), then 'a' is equal to

(A) 13 (B) –13 (C) 11 (D) –11

9. In the figure the sum of distance AD and BD is



(A) between 10 and 11 (B) 12 (C) between 15 and 16 (D) between 16 and 17

10. If $x = \frac{4}{\left(\sqrt{5}+1\right)\left(\sqrt[4]{5}+1\right)\left(\sqrt[8]{5}+1\right)}$. Then the value of $(1 + x)^{24}$ is

(A) 5 (B) 25 (C) 125 (D) 625

LEVEL-II

[SINGLE CORRECT CHOICE TYPE]

11. If $5^{10x} = 4900$, $2^{\sqrt{y}} = 25$ then the value of $\frac{\left(5^{(x-1)}\right)^5}{4^{-\sqrt{y}}}$ is

(A) $\frac{14}{5}$ (B) 5 (C) $\frac{28}{5}$ (D) 14

12. Let p, q be real numbers satisfying $p^2 - q^2 = 4$ and $2pq = 3$ then $(p^2 + q^2)$ is equal to

(A) 1 (B) 9 (C) 16 (D) 5

13. If $\frac{l}{\sqrt{10}+\sqrt{14}+\sqrt{15}+\sqrt{21}} = \frac{\sqrt{10}-\sqrt{14}-\sqrt{15}+\sqrt{21}}{k}$, then

(A) $k = \ell/2$ (B) $\ell = k/2$ (C) $\ell = 2/k$ (D) None of these

14. Let $x = \sqrt{3-\sqrt{5}}$ and $y = \sqrt{3+\sqrt{5}}$. If the value of the expression $x - y + 2x^2y + 2xy^2 - x^4y + xy^4$ can be expressed in the form $\sqrt{p} + \sqrt{q}$ where $p, q \in N$, then $(p + q)$ has the value equal

(A) 410 (B) 610 (C) 510 (D) 540

[MATRIX TYPE]

Q.15 Has **four** statements (A,B,C and D) given in **Column-I** and **five** statements (P, Q, R, S and T) given in **Column-II**. Any given statement in **Column-I** can have correct matching with one or more statement(s) given in **Column-II.**

15.

Column-I	**Column-II**
(A) A rectangular box has volume 48, and the sum of the length of the twelve edges (all integers) of the box is 48. The largest integer that could be the length of an edge of the box, is	(P) 1
(B) The number of zeroes at the end in the product of first 20 prime numbers, is	(Q) 2
(C) The number of solutions of $2^{2x} - 3^{2y} = 55$, in which x and y are integers, is	(R) 3
	(S) 4
(D) The number $\left(7+5\sqrt{2}\right)^{1/3} + \left(7-5\sqrt{2}\right)^{1/3}$, is equal to	(T) 6

Answers

RACE # 02

1. (C) **2.** (D) **3.** (B) **4.** (B) **5.** (C) **6.** (A) **7.** (B) **8.** (A) **9.** (C) **10.** (C)
11. (D) **12.** (D) **13.** (C) **14.** (B) **15.** A-T, B-P, C-P, D-Q