

RACE # 27

MATHEMATICS

TIME : 45 Min.

M.M. : 44

SECTION-I(i)

One or more than one Correct Answer Type (4 Marks each, -1 for wrong answer)

- If $x^2 + ax + a > 0 \forall x \in \mathbb{R}$, then number of integral values of 'a' is -
(A) 2 (B) 3 (C) 4 (D) 5
- The number of solutions of $\log_2 x = \log_4(x+1)$ is -
(A) 0 (B) 1 (C) 2 (D) 3
- If the product of the roots of the equation $x^2 - 3ax + 2b^{2\log_b a} - 1 = 0$ is 17 ($b > 0, \neq 1$), then the equation has real roots for :
(A) $a = -3$ (B) $a = 3$ (C) $a = \pm 3$ (D) $a = 9$
- If (x_0, y_0) is real solution of simultaneous equations $y = \log_x 2$ & $2 \log_2 x^2 = \log_{x^2} 2^y$, then-
(A) $y_0^2 = x_0$ (B) $y_0^{x_0} = 2$ (C) $x_0^{y_0} = \frac{1}{2}$ (D) $y_0 = x_0^2$
- For $x \in [1, 16]$, M and m denotes maximum and minimum values of $f(x) = \log_2^2 x - \log_2 x^3 + 3$ respectively, then value of $(2M - 4m)$ is-
(A) 5 (B) 2 (C) 8 (D) 11
- For the equation $3^{2x^2} - 2 \cdot 3^{x^2+4x-4} + 3^{8x-8} = 0$, which of the following holds good ?
(A) The equation has rational solution.
(B) The equation has irrational solution.
(C) The equation has exactly one solution.
(D) The equation has more than one solution.

7SECTION-III(i)

Numerical Grid Type (Single digit Ranging from 0 to 9) (4 Marks each, -1 for wrong answer)

- The value of $\left(7^{\log_5 9} - 9^{\log_5 7}\right)^4 - \log_{(3-\sqrt{8})} \left(\frac{3+\sqrt{8}}{3-\sqrt{8}}\right) + \log_{12} 36 \log_8 12 \log_6 8$ is
- Let $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{12}$, then $\log_{9602} \left(x^4 + \frac{1}{x^4}\right)^6$ is

9. If α, β, γ are roots of $x^3 - 4x^2 + 18x - 3 = 0$, then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma}$ is equal to

SECTION-IV

Matrix Match Type (One or More than one option correct)

For each entry in **Column-I**, +2 If only the bubble(s) corresponding to all the correct matche(s) is (are) darkened, 0 In none of the bubbles is darkened, -1 In all other cases

10. Match the following inequalities with the intervals in which they are true.

Column-I

- (A) $\frac{(x+1)(x-3)}{(x+4)(x-2)} < 0$
(B) $(1-x)(x-3)(x-2)^2 > 0$
(C) $\frac{x^2+x+4}{2x-1} > 2$
(D) $\frac{x^2+2}{x^2-1} < -2$

Column-II

- (P) $x \in \left(\frac{1}{2}, \infty\right)$
(Q) $x \in (-1, 0) \cup (0, 1)$
(R) $x \in (-4, -1) \cup (2, 3)$
(S) $x \in (1, 2) \cup (2, 3)$

RACE # 26 (NP-I,II,II)

MATHEMATICS

SECTION-I	Q.	1	2	3	4	5	6	7		
	A.	B	A	D	D	C	A	B		
SECTION-III	Q.	8	9	10						
	A.	5	3	4						