

RACE # 36

MATHEMATICS

TIME : 45 Min.

M.M. : 35

SECTION-I(i)

Straight Objective Type (3 Marks each, -1 for wrong answer)

- If $\tan(7x^\circ) = \frac{\sin x^\circ \cos y^\circ + \cos x^\circ \sin y^\circ}{\cos x^\circ \cos y^\circ - \sin x^\circ \sin y^\circ}$ where $x + y = 134^\circ$, then the least positive integral value of x , is-
(A) 122° (B) 172° (C) 100° (D) 132°
- $\ln\left(\frac{3}{\sqrt{3}}\right) - \ln(2 + \sqrt{3})$ equals (where $\ln x = \log_e x$)
(A) $\ln \sqrt{3} + \ln(2 - \sqrt{3})$ (B) $\ln 3 - \ln(2 - \sqrt{3})$
(C) $\ln 3 - \ln(2 + \sqrt{3})$ (D) $\ln \sqrt{3} + \ln(2 + \sqrt{3})$
- The product of all values of x which make the following statement true $(\log_3 x)(\log_5 9) - \log_x 25 + \log_3 2 = \log_3 54$, is
(A) $\sqrt{5}$ (B) 5 (C) $5\sqrt{5}$ (D) 25
- Given $\log_{10} 2 = a$ and $\log_{10} 3 = b$. If $3^{x+2} = 45$, then the value of x in terms of a and b is -
(A) $\frac{a-1}{b}$ (B) $\frac{1-a}{b}$ (C) $\frac{1+a}{b}$ (D) $\frac{b}{1-a}$
- If $\log_{\sqrt{2}} \sqrt{x} + \log_2 x + \log_4 (x^2) + \log_8 (x^3) + \log_{16} (x^4) = 40$ then x is equal to -
(A) 8 (B) 16 (C) 32 (D) 256

SECTION-I(ii)

Multiple Correct Answer Type (4 Marks each, -1 for wrong answer)

- The value of x satisfying the equation $2\log_{10} x - \log_{10} (2x - 75) = 2$ is
(A) 150 (B) 50 (C) 200 (D) 250
- Which of the following when simplified, reduces to unity?
(A) $\log_{10} 5 \cdot \log_{10} 20 + \log_{10}^2 2$ (B) $\frac{2\log 2 + \log 3}{\log 48 - \log 4}$
(C) $-\log_5 \log_3 \sqrt[5]{9}$ (D) $\frac{1}{6} \log_{\frac{\sqrt{3}}{2}} \left(\frac{64}{27}\right)$

SECTION-III(i)

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

- If $\tan A$ & $\tan B$ are the roots of the quadratic equation, $ax^2 + bx + c = 0$ then evaluate
$$\frac{a \sin^2(A+B) + b \sin(A+B) \cdot \cos(A+B) + c \cos^2(A+B)}{c}$$
- If $\cos(\alpha + \beta) + \sin(\alpha - \beta) = 0$ and $\tan \beta = \frac{1}{2008}$. Find $|\tan \alpha|$.
- The number of solutions of $\log_{\csc x} \sin x > 0$, in $(0, 90^\circ)$, is -

RACE # 35

MATHEMATICS

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