RACE # 36 MATHEMATICS

TIME : 45 Min. M.M. : 35

SECTION–I(i)

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

1. If $\tan(7x^\circ) = \dfrac{\sin x^\circ \cos y^\circ + \cos x^\circ \sin y^\circ}{\cos x^\circ \cos y^\circ - \sin x^\circ \sin y^\circ}$ where $x + y = 134^\circ$, then the least positive integral value of x, is-

(A) 122° (B) 172° (C) 100° (D) 132°

2. $l\text{n}\left(\dfrac{3}{\sqrt{3}}\right) - l\text{n}\left(2+\sqrt{3}\right)$ equals (where $l\text{n}x = \log_e x$)

(A) $l\text{n}\sqrt{3} + l\text{n}\left(2-\sqrt{3}\right)$ (B) $l\text{n}\,3 - l\text{n}\left(2-\sqrt{3}\right)$

(C) $l\text{n}\,3 - l\text{n}\left(2-\sqrt{3}\right)$ (D) $l\text{n}\sqrt{3} + l\text{n}\left(2+\sqrt{3}\right)$

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

4. 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) $\dfrac{a-1}{b}$ (B) $\dfrac{1-a}{b}$ (C) $\dfrac{1+a}{b}$ (D) $\dfrac{b}{1-a}$

5. 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)

6. 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

7. Which of the following when simplified, reduces to unity ?

(A) $\log_{10}5.\log_{10}20 + \log_{10}^2 2$ (B) $\dfrac{2\log 2 + \log 3}{\log 48 - \log 4}$

(C) $-\log_5 \log_3 \sqrt{\sqrt[5]{9}}$ (D) $\dfrac{1}{6}\log_{\frac{\sqrt{3}}{2}}\left(\dfrac{64}{27}\right)$

SECTION–III(i)

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

8. If tanA & tanB are the roots of the quadratic equation, $ax^2 + bx + c = 0$ then evaluate

$$\frac{a\sin^2(A+B) + b\sin(A+B).\cos(A+B) + c\cos^2(A+B)}{c}$$

9. If $\cos(\alpha + \beta) + \sin(\alpha - \beta) = 0$ and $\tan\beta = \dfrac{1}{2008}$. Find $|\tan\alpha|$.

10. The number of solutions of $\log_{\text{cosec}x}\sin x > 0$, in $(0, 90^\circ)$, is -

RACE # 35 (NP-I,II,II) **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