Class:XI **Time: 45 Min.** **M.M:36** **DPP. NO.-6**

[STRAIGHT OBJECTIVE TYPE] [4 × 3 = 12]

Q.1 Let $x = 2^{\log 3}$ and $y = 3^{\log 2}$ where base of the logarithm is 10, then which one of the following holds good?

(A) $2x < y$ (B) $2y < x$ (C) $3x = 2y$ (D) $y = x$

Q.2 Which one of the following is the smallest?

(A) $\log_{10}\pi$ (B) $\sqrt{\log_{10}\pi^2}$ (C) $\left(\frac{1}{\log_{10}\pi}\right)^3$ (D) $\left(\frac{1}{\log_{10}\sqrt{\pi}}\right)$

Q.3 If $x = \log_k b = \log_b c = \frac{1}{2}\log_c d$ then $\log_k d$ equals

(A) $2x^3$ (B) $\frac{x^3}{2}$ (C) $2x^8$ (D) $6x$

Q.4 The number $N = 6\log_{10}2 + \log_{10}31$, lies between two successive integers whose sum is equal to

(A) 5 (B) 7 (C) 9 (D) 10

[MULTIPLE OBJECTIVE TYPE] [2 × 4 = 8]

Q.5 Select the correct statement.

(A) $\log_3 19 \cdot \log_{1/7} 3 \cdot \log_4\left(\frac{1}{7}\right) < 2$

(B) The equation $\log_{1/3}(x^2 + 8) = -2$ has two real solutions.

(C) Let $N = \log_2 15 \cdot \log_{1/6} 2 \cdot \log_3\left(\frac{1}{6}\right)$. The greatest integer which is less than or equal to N is 3.

(D) The equation $\log_4 x + \log_4(x + 2) = \log_4(3x)$ has no prime solution.

Q.6 The equation $\frac{\log_8(8/x^2)}{(\log_8 x)^2} = 3$ has

(A) no integral solution (B) one natural solution
(C) two real solutions (D) one irrational solution

[MATCH THE COLUMN] [3+3+3+3=12]

Q.7

	Column-I		Column-II
(A)	If x_1 and x_2 satisfy the equation $x^{\log_{10} x} = 100x$ then the value of x_1x_2 equals	(P)	irrational
(B)	Sum of the squares of the roots of the equation $\log_2(9 - 2^x) = 3 - x$ is	(Q)	rational
(C)	If $\log_{1/8}\left(\log_{1/4}\left(\log_{1/2} x\right)\right) = \frac{1}{3}$ then x is	(R)	prime
(D)	If $\log_b a = 3, \log_b c = -4$. If the value of x satisfying the equation $a^{3x} = c^{x-1}$ is expressed in the form p/q, where p and q are relatively prime then p + q is	(S)	composite

[SUBJECTIVE]

Q.8 A polynomial in x of degree three vanishes when x = 1 and x = – 2, and has the values 4 and 28 when x = – 1 and x = 2 respectively. Find the polynomial. **[4]**