LAKSHYA (JEE)

Relations and Functions

DPP-05

1. Numerical value of the expression $\left|\frac{3x^3+1}{2x^2+2}\right|$ for $x=-3$ is

(A) 4 (B) 2
(C) 3 (D) 0

2. Suppose that a function f: R $\to$ R satisfies f(x + y) = f(x) f(y) for all x, y $\in$ R and f(1) = 3. If $\sum_{i=1}^{n} f(i) = 363$ then n is equal to_____.

3. Let $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$ for k =1, 2, 3,…. Then for all x $\in$ R, the value of $f_4(x) - f_6(x)$ is equal to

(A) $\frac{1}{4}$ (B) $\frac{5}{12}$
(C) $\frac{-1}{12}$ (D) $\frac{1}{12}$

4. If $\log_{10}\sin x + \log_{10}\cos x = -1$ and $\log_{10}(\sin x + \cos x) = \frac{(\log_{10} n)-1}{2}$ then the value of 'n' is

(A) 24 (B) 36
(C) 20 (D) 12

5. Let f: R $\to$ R be a function which satisfies f(x + y) = f(x) + f(y) $\forall$ x, y $\in$ R. If f(1) = 2 and g(n) = $\sum_{k=1}^{(n-1)} f(k), n \in N$ then the value of n, for which g(n) = 20, is:

(A) 20 (B) 9
(C) 5 (D) 4

6. $(\log_2 3).(\log_3 4).(\log_4 5)\ldots\log_n(n+1) = 10$. Find n = ?

7. 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

8. Suppose $\log_a 2 = m$, $\log_a 3 = r$, $\log_a 5 = s$ and $\log_a 11 = t$. The value of $\log_a 990$, is

(A) 2mrst (B) m – 2r + s + t
(C) m + r + s + t (D) m + 2r + s + t

9. If $f(x) = \frac{\cos^2 x + \sin^4 x}{\sin^2 x + \cos^4 x}$ for $x \in R$, then $f(2002) =$

(A) 1 (B) 2
(C) 3 (D) 4

10. The number of elements in the set {x $\in$ R: (|x| – 3) | x + 4 | = 6} is equal to:

(A) 4 (B) 2
(C) 3 (D) 1

ANSWERS

1. (A)
2. (5)
3. (D)
4. (D)
5. (C)
6. (1023)
7. (B)
8. (D)
9. (A)
10. (B)

Note - If you have any query/issue

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