MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 19

Total Marks : 28

Max. Time : 30 min.

Topics : Fundamentals of Mathematics, Function, Limits

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1,2	**(3 marks, 3 min.)**	**[6, 6]**
Multiple choice objective (no negative marking) Q.3	**(5 marks, 4 min.)**	**[5, 4]**
Assertion and Reason (no negative marking) Q.4	**(3 marks, 3 min.)**	**[3, 3]**
Subjective Questions (no negative marking) Q.5,6,8	**(4 marks, 5 min.)**	**[12, 15]**
True or False (no negative marking) Q.7	**(2 marks, 2 min.)**	**[2, 2]**

1. The solution set of the inequality max $\{1 - x^2, |x - 1|\} < 1$ is

(A) $(-\infty, 0) \cup (1, \infty)$ (B) $(-\infty, 0) \cup (2, \infty)$ (C) $(0, 2)$ (D) $(-1, 1)$

2. If $h(x) = \log_{10} x$, then the value of $\sum_{n=1}^{89} h(\tan n^\circ) =$

(A) 1 (B) 0 (C) – 1 (D) none of these

3. If f = sin |cos x|, g = cos |sin y|, then

(A) least value of f + g is cos 1 (B) greatest value of f + g is sin 1

(C) period of g is $\frac{\pi}{2}$ (D) greatest value of f + g is 1 + sin 1

4. In both the statements [.] represents greatest integer function.

STATEMENT-1 : The greatest value of $\sin\left(\frac{3}{2}x - \frac{3}{2}[x]\right)$ is $\sin\frac{3}{2}$.

STATEMENT-2 : The greatest value of [sin x] is 1, where $x \in R$.

(A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(C) Statement-1 is True, Statement-2 is False

(D) Statement-1 is False, Statement-2 is True

5. Solve for x : $(|x| - 5)(|x - 1| - 1) < 0$

6. Evaluate the following limits

(i) $\lim_{x\to 0} \frac{\sin x^4 - x^4 . \cos x^4}{x^4(e^{2x^4} - 1 - 2x^4)}$ (ii) $\lim_{x\to 0^+} (1 + 2\cos x)^2$

7. The function, $\sqrt{x-1} + \sqrt[3]{x-3} + \sqrt[4]{5-x}$ and $\sin^{-1}\left(\frac{x-3}{2}\right)$ have identical domains . **[True or False]**

8. If f(x) is non - zero polynomial function such that $f(2x) = f'(x)\, f''(x)$, then f(x) = ________ .

Answers Key

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

5. $x \in (-5, 0) \cup (2, 5)$ **6.** (i) 1/6 (ii) 9

7. True **8.** $\frac{4x^3}{9}$