MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 31

Total Marks : 27

Max. Time : 27 min.

Topics : Sequence & Series, Application of Derivatives

Type of Questions		**M.M., Min.**
Comprehension (no negative marking) Q.1 to Q.3	**(3 marks, 3 min.)**	**[9, 9]**
Single choice Objective (no negative marking) Q.4,5,6	**(3 marks, 3 min.)**	**[9, 9]**
Multiple choice objective (no negative marking) Q.7	**(5 marks, 4 min.)**	**[5, 4]**
Subjective Questions (no negative marking) Q.8	**(4 marks, 5 min.)**	**[4, 5]**

COMPREHENSION (Q. NO. 1 TO 3)

If $S = -1 - 1 + 1 + 7 + 19 + 39 + 69 + ...$, then

1. n^{th} term (t_n) will be

(A) $\frac{-6+(n-1)(n-2)^2}{6}$ (B) $\frac{-3+(n-1)(n-2)^2}{6}$

(C) $\frac{n^3-3n^2+2n-3}{3}$ (D) None of these

2. t_{10} is equal to

(A) 299 (B) 239 (C) 171 (D) 211

3. Sum of first 10 term (S_{10}) is equal to -

(A) 650 (B) 659 (C) 560 (D) 625

4. The gradient of the common tangent to the two curves $y = x^2 - 5x + 6$ and $y = x^2 + x + 1$ is :

(A) $-1/3$ (B) $-2/3$ (C) -1 (D) -3

5. A curve with equation of the form $y = ax^4 + bx^3 + cx + d$ has zero gradient at the point (0, 1) and also touches the x – axis at the point (– 1, 0) then the values of x for which the curve has a negative gradient are :

(A) $x > -1$ (B) $x < 1$ (C) $x < -1$ (D) $-1 \le x \le 1$

6. The equation of the tangent to the curve $y = e^{-|x|}$ at the point where the curve cuts the line x = 1 is

(A) x + y = e (B) e(x + y) = 1 (C) y + ex = 1 (D) None of these

7. If a line is tangent to one point and normal at another point on the curve $x = 4t^2 + 3$, $y = 8t^3 - 1$, then slope of such a line is

(A) – 1 (B) 1 (C) $-\sqrt{2}$ (D) $\sqrt{2}$

8. Show that the curves $x^3 - 3xy^2 = a$ and $3x^2y - y^3 = b$ cut each other orthogonally where a and b are constants.

Answers Key

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

5. (C) **6.** (D) **7.** (C)(D)