

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 $S = -1 - 1 + 1 + 7 + 19 + 39 + 69 + \dots$, 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) $-1 \leq x \leq 1$

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)