## **MATHEMATICS**



## DPP No. 31

**Total Marks: 27** 

Max. Time: 27 min.

Type of Questions		M.M., Min.	
Comprehension (no negative marking) Q.1 to Q.3 Single choice Objective (no negative marking) Q.4,5,6	(3 marks, 3 min.) (3 marks, 3 min.)	[9, [9,	9] 91
Multiple choice objective (no negative marking) Q.4,5,6	(5 marks, 4 min.)	[5, [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) 
$$-1 \le x \le 1$$

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) 
$$y + ex = 1$$

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

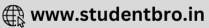
$$(A) - 1$$

(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)

