MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 2

Total Marks : 24

Max. Time : 24 min.

Topics : Fundamentals of Mathematics, Circle, Quadratic Equation, Determinants

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q. 1, 2, 3	**(3 marks, 3 min.)**	**[9, 9]**
Short Subjective Questions (no negative marking) Q. 4, 5, 6, 7, 8	**(3 marks, 3 min.)**	**[15, 15]**

1. The integral values of x for which $x^2 + 7x + 13$ is perfect square are

(A) – 4, 5, 2 (B) – 3, – 2 (C) – 4, – 3, – 2 (D) – 4, – 3

2. Two equal circles of radius R are touching each other externally . If a smaller circle of radius ' r ' is touching both of these circles as well as their direct common tangent , then the ratio r : R is :

(A) 1 : $\sqrt{2}$ (B) 1 : 2 (C) 1 : $2\sqrt{2}$ (D) 1 : 4

3. If the equation $\sin^4 x - (k + 2)\sin^2 x - (k + 3) = 0$ has a solution then k must lie in the interval :

(A) $(-4, -2)$ (B) $[-3, 2)$ (C) $(-4, -3)$ (D) $[-3, -2]$

4. Show that $x^4 + 4$ is prime for only one value of $x \in N$

5. Find the range of values of x for which the equaiton $[x]^2 + \lceil x \rceil^2 = 13$ holds true.

(Here [x] denotes the greatest integer just less than or equal to x and $\lceil x \rceil$ denotes the least integer just greater than or equal to x)

6. Find the locus of the middle points of chords of the circle $x^2 + y^2 = a^2$ which subtend a right angle at the point (c , 0).

7. Show that $\Delta = \begin{vmatrix} b^2+c^2 & ab & ac \\ ab & c^2+a^2 & bc \\ ca & cb & a^2+b^2 \end{vmatrix} = 4a^2b^2c^2$

8. Prove that $\begin{vmatrix} -bc & b^2+bc & c^2+bc \\ a^2+ac & -ac & c^2+ac \\ a^2+ab & b^2+ab & -ab \end{vmatrix} = (ab + bc + ca)^3$.

Answers Key

1. (D)

2. (D)

3. (D)

5. $x \in (-3, -2) \cup (2, 3)$

6. $2x^2 + 2y^2 - 2cx + c^2 - a^2 = 0$