MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 58

Total Marks : 22

Max. Time : 23 min.

Topics : Sequence & Series, Circle, Fundamentals of Mathematics

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]
Subjective Questions (no negative marking) Q.7	(4 marks, 5 min.)	[4, 5]

COMPREHENSION (Q.1 to 3)

Consider 3 circles

S_1 : $x^2 + y^2 + 2x - 3 = 0$

S_2 : $x^2 + y^2 - 1 = 0$

S_3 : $x^2 + y^2 + 2y - 3 = 0$

1. The radius of the circle which bisect the circumference of the circles $S_1 = 0$, $S_2 = 0$, $S_3 = 0$ is

(A) 2 (B) $2\sqrt{2}$ (C) 3 (D) $\sqrt{10}$

2. If the circle $S = 0$ is orthogonal to $S_1 = 0$, $S_2 = 0$ and $S_3 = 0$ and has its centre at (a, b) and radius equal to 'r', then the value of (a + b + r) equals

(A) 0 (B) 1 (C) 2 (D) 3

3. The radius of the circle touching $S_1 = 0$ and $S_2 = 0$ at (1, 0) and passing through (3, 2) is

(A) 1 (B) $\sqrt{12}$ (C) 2 (D) $2\sqrt{2}$

4. 61^{st} term of the H.P. $\frac{4}{3}, \frac{3}{2}, \frac{12}{7}, \ldots\ldots\ldots$ is

(A) $-\frac{17}{4}$ (B) $\frac{34}{3}$ (C) $\frac{3}{34}$ (D) $-\frac{4}{17}$

5. The expression $f(x) = \sum_{k=1}^{5} (x-k)^2$ assumes minimum value for x given by

(A) 3 (B) 2 (C) $\frac{5}{2}$ (D) 5

6. (6, 0), (0, 6) and (7, 7) are the vertices of a triangle. The circle inscribed in the triangle has the equation

(A) $x^2 + y^2 - 9x + 9y + 36 = 0$ (B) $x^2 + y^2 - 9x - 9y + 36 = 0$

(C) $x^2 + y^2 + 9x - 9y + 36 = 0$ (D) $x^2 + y^2 - 9x - 9y - 36 = 0$

7. If $x > 0$, $y > 0$, $z > 0$, prove that $x^{\ell n\left(\frac{y}{z}\right)} + y^{\ell n\left(\frac{z}{x}\right)} + z^{\ell n\left(\frac{x}{y}\right)} \geq 3$.

Answers Key

1. (C)

2. (D)

3. (C)

4. (D)

5. (A)

6. (B)