MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 28

Total Marks : 38

Max. Time : 38 min.

Topic : Straight Line

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.2, 3, 5, 6, 7, 9	(3 marks, 3 min.)	[18, 18]
Multiple choice objective ('–1' negative marking) Q.8	(5 marks, 4 min.)	[5, 4]
Subjective Questions ('–1' negative marking) Q.4,	(4 marks, 5 min.)	[4, 5]
Assertion and Reason (no negative marking) Q.1,	(3 marks, 3 min.)	[3, 3]
Match the Following (no negative marking) (2 × 4) Q.10	(8 marks, 8 min.)	[8, 8]

1. The line $L_1 : y - x = 0$ and $L_2 : 2x + y = 0$ intersect the line $L_3 : y + 2 = 0$ at P and Q respectively. The bisector of the acute angle between L_1 and L_2 intersects L_3 at R.

Statement-1 : The ratio PR : RQ equals $2\sqrt{2} : \sqrt{5}$

Statement-2 : In any triangle, bisector of an angle divides the triangle into two similar triangles.

(A) Statement-1 is true, Statement-2 is true ; Statement-2 is correct explanation for Statement-1

(B) Statement-1 is true, Statement-2 is true ; Statement-2 is **not** a correct explanation for Statement-1

(C) Statement-1 is true, Statement-2 is false

(D) Statement-1 is false, Statement-2 is true

2. If the straight lines joining the origin and the points of intersection of the curve $5x^2 + 12xy - 6y^2 + 4x - 2y + 3 = 0$ and $x + ky - 1 = 0$ are equally inclined to the co-ordinate axes then the value of k :

(A) is equal to 1 (B) is equal to -1

(C) is equal to 2 (D) does not exist in the set of real numbers .

3. Consider points A(3, 4) and B(7, 13). If P be a point on the line y = x such that PA + PB is minimum, then coordinates of P are

(A) $\left(\frac{12}{7}, \frac{12}{7}\right)$ (B) $\left(\frac{13}{7}, \frac{13}{7}\right)$ (C) $\left(\frac{31}{7}, \frac{31}{7}\right)$ (D) (0, 0)

4. Let the algebraic sum of the perpendicular distance from the points (2, 0), (0, 2) and (1, 1) to a variable straight line be zero, then the line passes through a fixed point whose coordinates are .....

5. The straight line x – y – 2 = 0 cuts the axis of x at A. It is rotated about A in such a manner that it is perpendicular to ax + by + c = 0. Its equation is :

(A) bx – ay – 2b = 0 (B) ax – by – 2a = 0

(C) bx + ay – 2b = 0 (D) ax + by + 2a = 0

6. Chords of the curve $4x^2 + y^2 - x + 4y = 0$ which subtend a right angle at the origin pass through a fixed point whose co-ordinates are :

(A) $\left(\frac{1}{5}, -\frac{4}{5}\right)$ (B) $\left(-\frac{1}{5}, \frac{4}{5}\right)$ (C) $\left(\frac{1}{5}, \frac{4}{5}\right)$ (D) $\left(-\frac{1}{5}, -\frac{4}{5}\right)$

7. The interior angle bisector of angle A for the triangle ABC whose coordinates of the vertices are A(–8, 5) ; B(–15, –19) and C(1, –7) has the equation $ax + 2y + c = 0$, then (a, c) =

(A) (10, 77) (B) (11, 78) (C) (12, 78) (D) (9, 67)

8. The graph of $y = f(x)$ is symmetrical about the line $x = 1$, then

(A) $f(-x) = f(x)$ (B) $f(1 + x) = f(1 - x)$

(C) $f(x + 1) = f(x - 1)$ (D) $f(x) = f(2 - x)$

9. The straight line, $ax + by = 1$ makes with the curve $px^2 + 2a\,xy + qy^2 = r$ a chord which subtends a right angle at the origin . Then :

(A) $r(a^2 + b^2) = p + q$ (B) $r(a^2 + p^2) = q + b$

(C) $r(b^2 + q^2) = p + a$ (D) none of these

10. Consider the general equation of second degree $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$. If this represents a pair of straight lines, match the two columns in the most accurate sense.

Match the column

	Column – I		**Column – II**
(A)	If (x_1, y_1) is the point of intersection of the two lines, then $(ax_1 + hy_1)(hx_1 + by_1) =$	(p)	$\frac{c}{\sqrt{(a-b)^2 + 4h^2}}$
(B)	$af^2 + bg^2 + ch^2 =$	(q)	ab
(C)	The lines are parallel if $h^2 =$	(r)	gf
(D)	Product of perpendiculars from the origin	(s)	abc + 2fgh

Answers Key

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

5. (A) **6.** (A) **7.** (B)

8. (B)(D) **9.** (A)

10. (A) $\rightarrow$ (r), (B) $\rightarrow$ (s), (C) $\rightarrow$ (q), (D) $\rightarrow$ (p)