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QUESTION BANK

STRAIGHT LINE & CIRCLE

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[STRAIGHT OBJECTIVE TYPE]

Q.1 If the lines $x + y + 1 = 0$; $4x + 3y + 4 = 0$ and $x + \alpha y + \beta = 0$, where $\alpha^2 + \beta^2 = 2$, are concurrent then
(A) $\alpha = 1, \beta = -1$ (B) $\alpha = 1, \beta = \pm 1$ (C) $\alpha = -1, \beta = \pm 1$ (D) $\alpha = \pm 1, \beta = 1$

Q.2 The line $2x - y + 1 = 0$ is tangent to the circle at the point (2, 5) and the centre of the circles lies on $x - 2y = 4$. The radius of the circle is
(A) $3\sqrt{5}$ (B) $5\sqrt{3}$ (C) $2\sqrt{5}$ (D) $5\sqrt{2}$

Q.3 Given the family of lines, $a(3x + 4y + 6) + b(x + y + 2) = 0$. The line of the family situated at the greatest distance from the point P (2, 3) has equation :
(A) $4x + 3y + 8 = 0$ (B) $5x + 3y + 10 = 0$ (C) $15x + 8y + 30 = 0$ (D) none

Q.4 If the circles $x^2 + y^2 + 2ax + cy + a = 0$ and $x^2 + y^2 - 3ax + dy - 1 = 0$ intersect in two distinct points P and Q then the line $5x + by - a = 0$ passes through P and Q for
(A) exactly one value of a (B) no value of a
(C) infinitely many values of a (D) exactly two values of a

Q.5 A variable rectangle PQRS has its sides parallel to fixed directions. Q and S lie respectively on the lines $x = a$, $x = -a$ and P lies on the x – axis. Then the locus of R is
(A) a straight line (B) a circle (C) a parabola (D) pair of straight lines

Q.6 Circle is inscribed in a square ABCD of length 2a units, taking AB and AD along the axes OX and OY respectively. If E is a point on DC such that 3 DE = DC and F is a point on BA produced such that FA = AB, and EF is a tangent to the circle then the ratio in which the point of tangency divides EF is
(A) 9 : 1 (B) 2 : 3 (C) 1 : 9 (D) 7 : 2

Q.7 A rectangular billiard table has vertices at P(0, 0), Q(0, 7), R(10, 7) and S (10, 0). A small billiard ball starts at M(3, 4) and moves in a straight line to the top of the table, bounces to the right side of the table, then comes to rest at N(7, 1). The y-coordinate of the point where it hits the right side, is
(A) 3.7 (B) 3.8 (C) 3.9 (D) 4

Q.8 Four unit circles pass through the origin and have their centres on the coordinate axes. The area of the quadrilateral whose vertices are the points of intersection (in pairs) of the circles, is
(A) 1 sq. unit (B) $2\sqrt{2}$ sq. units
(C) 4 sq. units (D) can not be uniquely determined, insufficient data

Q.9 Through a point A on the x-axis a straight line is drawn parallel to y-axis so as to meet the pair of straight lines $ax^2 + 2hxy + by^2 = 0$ in B and C. If AB = BC then
(A) $h^2 = 4ab$ (B) $8h^2 = 9ab$ (C) $9h^2 = 8ab$ (D) $4h^2 = ab$

Q.10 Consider 3 non collinear points A, B, C with coordinates (0, 6), (5, 5) and (–1, 1) respectively. Equation of a line tangent to the circle circumscribing the triangle ABC and passing through the origin is
(A) $2x - 3y = 0$ (B) $3x + 2y = 0$
(C) $3x - 2y = 0$ (D) $2x + 3y = 0$

Q.11 A, B and C are points in the xy plane such that A(1, 2) ; B (5, 6) and AC = 3BC. Then
(A) ABC is a unique triangle (B) There can be only two such triangles.
(C) No such triangle is possible (D) There can be infinite number of such triangles.

Q.12 To which of the following circles, the line $y-x+3=0$ is normal at the point $\left(3+\frac{3}{\sqrt{2}}, \frac{3}{\sqrt{2}}\right)$?

(A) $\left(x-3-\frac{3}{\sqrt{2}}\right)^2+\left(y-\frac{3}{\sqrt{2}}\right)^2=9$ (B) $\left(x-\frac{3}{\sqrt{2}}\right)^2+\left(y-\frac{3}{\sqrt{2}}\right)^2=9$

(C) $x^2+(y-3)^2=9$ (D) $(x-3)^2+y^2=9$

Q.13 If A $(1, p^2)$; B (0, 1) and C (p, 0) are the coordinates of three points then the value of p for which the area of the triangle ABC is minimum, is

(A) $\frac{1}{\sqrt{3}}$ (B) $-\frac{1}{\sqrt{3}}$ (C) $\frac{1}{\sqrt{3}}$ or $-\frac{1}{\sqrt{3}}$ (D) none

Q.14 The circle with equation $x^2+y^2=1$ intersects the line $y=7x+5$ at two distinct points A and B. Let C be the point at which the positive x-axis intersects the circle. The angle ACB is

(A) $\tan^{-1}\left(\frac{4}{3}\right)$ (B) $\tan^{-1}\left(\frac{3}{4}\right)$ (C) $\tan^{-1}(1)$ (D) $\tan^{-1}\left(\frac{3}{2}\right)$

Q.15 Line AB passes through point (2, 3) and intersects the positive x and y axes at A(a, 0) and B(0, b) respectively. If the area of ΔAOB is 11, the numerical value of $4b^2+9a^2$, is

(A) 220 (B) 240 (C) 248 (D) 284

Q.16 The number of common tangents of the circles $(x+2)^2+(y-2)^2=49$ and $(x-2)^2+(y+1)^2=4$ is :

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

Q.17 Each member of the family of parabolas $y=ax^2+2x+3$ has a maximum or a minimum point depending upon the value of a. The equation to the locus of the maxima or minima for all possible values of 'a' is

(A) a straight line with slope 1 and y intercept 3. (B) a straight line with slope 2 and y intercept 2.

(C) a straight line with slope 1 and x intercept 3. (D) a circle

Q.18 Triangle ABC is right angled at A. The circle with centre A and radius AB cuts BC and AC internally at D and E respectively. If BD = 20 and DC = 16 then the length AC equals

(A) $6\sqrt{21}$ (B) $6\sqrt{26}$ (C) 30 (D) 32

Q.19 The co–ordinates of the point of reflection of the origin (0, 0) in the line $4x-2y-5=0$ is

(A) (1, – 2) (B) (2, – 1) (C) $\left(\frac{4}{5}, -\frac{2}{5}\right)$ (D) (2, 5)

Q.20 Combined equation to the pair of tangents drawn from the origin to the circle ; $x^2+y^2+4x+6y+9=0$ is :

(A) $3(x^2+y^2)=(x+2y)^2$ (B) $2(x^2+y^2)=(3x+y)^2$

(C) $9(x^2+y^2)=(2x+3y)^2$ (D) $x^2+y^2=(2x+3y)^2$

Q.21 A ray of light passing through the point A (1, 2) is reflected at a point B on the x – axis and then passes through (5, 3). Then the equation of AB is :

(A) $5x+4y=13$ (B) $5x-4y=-3$

(C) $4x+5y=14$ (D) $4x-5y=-6$

Q.22 If $x = 3$ is the chord of contact of the circle $x^2 + y^2 = 81$, then the equation of the corresponding pair of tangents, is
(A) $x^2 - 8y^2 + 54x + 729 = 0$ (B) $x^2 - 8y^2 - 54x + 729 = 0$
(C) $x^2 - 8y^2 - 54x - 729 = 0$ (D) $x^2 - 8y^2 = 729$

Q.23 m, n are integer with $0 < n < m$. A is the point (m, n) on the cartesian plane. B is the reflection of A in the line $y = x$. C is the reflection of B in the y-axis, D is the reflection of C in the x-axis and E is the reflection of D in the y-axis. The area of the pentagon ABCDE is
(A) $2m(m + n)$ (B) $m(m + 3n)$ (C) $m(2m + 3n)$ (D) $2m(m + 3n)$

Q.24 The locus of poles whose polar with respect to $x^2 + y^2 = a^2$ always passes through (K, 0) is
(A) $Kx - a^2 = 0$ (B) $Kx + a^2 = 0$ (C) $Ky + a^2 = 0$ (D) $Ky - a^2 = 0$

Q.25 The area enclosed by the graphs of $|x + y| = 2$ and $|x| = 1$ is
(A) 2 (B) 4 (C) 6 (D) 8

Q.26 Let C_1 and C_2 are circles defined by $x^2 + y^2 - 20x + 64 = 0$ and $x^2 + y^2 + 30x + 144 = 0$.
The length of the shortest line segment PQ that is tangent to C_1 at P and to C_2 at Q is
(A) 15 (B) 18 (C) 20 (D) 24

Q.27 If $P = (1, 0)$; $Q = (-1, 0)$ and $R = (2, 0)$ are three given points, then the locus of the points S satisfying the relation, $SQ^2 + SR^2 = 2\,SP^2$ is :
(A) a straight line parallel to x–axis (B) a circle passing through the origin
(C) a circle with the centre at the origin (D) a straight line parallel to y–axis .

Q.28 The equation of the pair of bisectors of the angles between two straight lines is, $12x^2 - 7xy - 12y^2 = 0$. If the equation of one line is $2y - x = 0$ then the equation of the other line is :
(A) $41x - 38y = 0$ (B) $11x + 2y = 0$ (C) $38x + 41y = 0$ (D) $11x - 2y = 0$

Q.29 The centre of the smallest circle touching the circles $x^2 + y^2 - 2y - 3 = 0$ and $x^2 + y^2 - 8x - 18y + 93 = 0$ is
(A) (3 , 2) (B) (4 , 4) (C) (2 , 7) (D) (2 , 5)

Q.30 Two points $A(x_1, y_1)$ and $B(x_2, y_2)$ are chosen on the graph of $f(x) = \ln x$ with $0 < x_1 < x_2$. The points C and D trisect line segment AB with AC < CB. Through C a horizontal line is drawn to cut the curve at $E(x_3, y_3)$. If $x_1 = 1$ and $x_2 = 1000$ then the value of x_3 equals
(A) 10 (B) $\sqrt{10}$ (C) $(10)^{2/3}$ (D) $(10)^{1/3}$

Q.31 A variable line moves in such way that the product of the perpendiculars from (a, 0) and (0, 0) is equal to k^2. The locus of the feet of the perpendicular from (0, 0) upon the variable line is a circle, the square of whose radius is (Given: $|a| < 2|k|$)
(A) $\frac{a^2}{4} + k^2$ (B) $\frac{a^2 + k^2}{4}$ (C) $a^2 + \frac{k^2}{4}$ (D) $\frac{a^2 + k^2}{2}$

Q.32 Consider a quadratic equation in Z with parameters x and y as
$$Z^2 - xZ + (x - y)^2 = 0$$
The parameters x and y are the co-ordinates of a variable point P w.r.t. an orthonormal co-ordinate system in a plane. If the quadratic equation has equal roots then the locus of P is
(A) a circle
(B) a line pair through the origin of co-ordinates with slope 1/2 and 2/3
(C) a line pair through the origin of co-ordinates with slope 3/2 and 2
(D) a line pair through the origin of co-ordinates with slope 3/2 and 1/2

Q.33 If the circle $C_1 : x^2 + y^2 = 16$ intersects another circle C_2 of radius 5 in such a manner that the common chord is of maximum length and has a slope equal to 3/4, then the co-ordinates of the centre of C_2 are :

(A) $\left(\pm\frac{9}{5}, \pm\frac{12}{5}\right)$ (B) $\left(\pm\frac{9}{5}, \mp\frac{12}{5}\right)$ (C) $\left(\pm\frac{12}{5}, \pm\frac{9}{5}\right)$ (D) $\left(\pm\frac{12}{5}, \mp\frac{9}{5}\right)$

Q.34 If L is the line whose equation is $ax + by = c$. Let M be the reflection of L through the y-axis, and let N be the reflection of L through the x-axis. Which of the following must be true about M and N for all choices of a, b and c?

(A) The x-intercepts of M and N are equal. (B) The y-intercepts of M and N are equal.
(C) The slopes of M and N are equal. (D) The slopes of M and N are reciprocal.

Q.35 Two lines $p_1x + q_1y + r_1 = 0$ and $p_2x + q_2y + r_2 = 0$ are conjugate lines w.r.t. the circle $x^2 + y^2 = a^2$ if

(A) $p_1p_2 + q_1q_2 = r_1r_2$ (B) $p_1p_2 + q_1q_2 + r_1r_2 = 0$
(C) $a^2(p_1p_2 + q_1q_2) = r_1r_2$ (D) $p_1p_2 + q_1q_2 = a^2 r_1r_2$

Q.36 Vertices of a parallelogram ABCD are A(3, 1), B(13, 6), C(13, 21) and D(3, 16). If a line passing through the origin divides the parallelogram into two congruent parts then the slope of the line is

(A) $\frac{11}{12}$ (B) $\frac{11}{8}$ (C) $\frac{25}{8}$ (D) $\frac{13}{8}$

Q.37 Let C be the circle of radius unity centred at the origin. If two positive numbers x_1 and x_2 are such that the line passing through $(x_1, -1)$ and $(x_2, 1)$ is tangent to C then

(A) $x_1x_2 = 1$ (B) $x_1x_2 = -1$ (C) $x_1 + x_2 = 1$ (D) $4x_1x_2 = 1$

Q.38 The line $x = c$ cuts the triangle with corners (0, 0); (1, 1) and (9, 1) into two regions. For the area of the two regions to be the same c must be equal to

(A) 5/2 (B) 3 (C) 7/2 (D) 3 or 15

Q.39 The locus of the middle points of the system of chords of the circle $x^2+y^2=16$ which are parallel to the line $2y = 4x + 5$ is

(A) $x = 2y$ (B) $x + 2y = 0$ (C) $y + 2x = 0$ (4) $y = 2x$

Q.40 The distance between the two parallel lines is 1 unit . A point 'A' is chosen to lie between the lines at a distance 'd' from one of them . Triangle ABC is equilateral with B on one line and C on the other parallel line . The length of the side of the equilateral triangle is

(A) $\frac{2}{3}\sqrt{d^2 + d + 1}$ (B) $2\sqrt{\frac{d^2 - d + 1}{3}}$ (C) $2\sqrt{d^2 - d + 1}$ (D) $\sqrt{d^2 - d + 1}$

Q.41 The distance between the chords of contact of tangents to the circle $x^2+y^2+2gx+2fy+c=0$ from the origin and the point (g, f) is

(A) $\sqrt{g^2 + f^2}$ (B) $\frac{\sqrt{g^2 + f^2 - c}}{2}$ (C) $\frac{g^2 + f^2 - c}{2\sqrt{g^2 + f^2}}$ (D) $\frac{\sqrt{g^2 + f^2 + c}}{2\sqrt{g^2 + f^2}}$

Q.42 Given A(0, 0) and B(x, y) with $x \in (0, 1)$ and $y > 0$. Let the slope of the line AB equals m_1. Point C lies on the line $x = 1$ such that the slope of BC equals m_2 where $0 < m_2 < m_1$. If the area of the triangle ABC can be expressed as $(m_1 - m_2)f(x)$, then the largest possible value of $f(x)$ is

(A) 1 (B) 1/2 (C) 1/4 (D) 1/8

Q.43 The points $A(a, 0)$, $B(0, b)$, $C(c, 0)$ and $D(0, d)$ are such that $ac = bd$ and a, b, c, d are all non-zero. Then the points
(A) form a parallelogram (B) do not lie on a circle
(C) form a trapezium (D) are concyclic

Q.44 Consider a parallelogram whose sides are represented by the lines $2x + 3y = 0$; $2x + 3y - 5 = 0$; $3x - 4y = 0$ and $3x - 4y = 3$. The equation of the diagonal not passing through the origin, is
(A) $21x - 11y + 15 = 0$ (B) $9x - 11y + 15 = 0$
(C) $21x - 29y - 15 = 0$ (D) $21x - 11y - 15 = 0$

Q.45 The locus of the centers of the circles which cut the circles $x^2 + y^2 + 4x - 6y + 9 = 0$ and $x^2 + y^2 - 5x + 4y - 2 = 0$ orthogonally is :
(A) $9x + 10y - 7 = 0$ (B) $x - y + 2 = 0$
(C) $9x - 10y + 11 = 0$ (D) $9x + 10y + 7 = 0$

Q.46 What is the y-intercept of the line that is parallel to $y = 3x$, and which bisects the area of a rectangle with corners at (0, 0), (4, 0), (4, 2) and (0, 2)?
(A) (0, – 7) (B) (0, – 6) (C) (0, – 5) (D) (0, – 4)

Q.47 The locus of the mid points of the chords of the circle $x^2 + y^2 + 4x - 6y - 12 = 0$ which subtend an angle of $\frac{\pi}{3}$ radians at its circumference is :
(A) $(x - 2)^2 + (y + 3)^2 = 6.25$ (B) $(x + 2)^2 + (y - 3)^2 = 6.25$
(C) $(x + 2)^2 + (y - 3)^2 = 18.75$ (D) $(x + 2)^2 + (y + 3)^2 = 18.75$

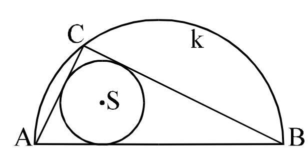
Q.48 Given $A \equiv (1, 1)$ and AB is any line through it cutting the x-axis in B. If AC is perpendicular to AB and meets the y-axis in C, then the equation of locus of mid- point P of BC is
(A) $x + y = 1$ (B) $x + y = 2$ (C) $x + y = 2xy$ (D) $2x + 2y = 1$

Q.49 The angle at which the circles $(x - 1)^2 + y^2 = 10$ and $x^2 + (y - 2)^2 = 5$ intersect is
(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{2}$

Q.50 In a triangle ABC, if A (2, – 1) and $7x - 10y + 1 = 0$ and $3x - 2y + 5 = 0$ are equations of an altitude and an angle bisector respectively drawn from B, then equation of BC is
(A) $x + y + 1 = 0$ (B) $5x + y + 17 = 0$ (C) $4x + 9y + 30 = 0$ (D) $x - 5y - 7 = 0$

Q.51 A circle of radius unity is centred at origin. Two particles start moving at the same time from the point (1, 0) and move around the circle in opposite direction. One of the particle moves counterclockwise with constant speed v and the other moves clockwise with constant speed 3v. After leaving (1, 0), the two particles meet first at a point P, and continue until they meet next at point Q. The coordinates of the point Q are
(A) (1, 0) (B) (0, 1) (C) (0, –1) (D) (–1, 0)

Q.52 AB is the diameter of a semicircle k, C is an arbitrary point on the semicircle (other than A or B) and S is the centre of the circle inscribed into triangle ABC, then measure of



(A) angle ASB changes as C moves on k.
(B) angle ASB is the same for all positions of C but it cannot be determined without knowing the radius.
(C) angle ASB = 135° for all C.
(D) angle ASB = 150° for all C.

Q.53 The value of 'c' for which the set, $\{(x, y) \mid x^2 + y^2 + 2x \le 1\} \cap \{(x, y) \mid x - y + c \ge 0\}$ contains only one point in common is :
(A) $(-\infty, -1] \cup [3, \infty)$ (B) $\{-1, 3\}$ (C) $\{-3\}$ (D) $\{-1\}$

Q.54 Given $\frac{x}{a} + \frac{y}{b} = 1$ and $ax + by = 1$ are two variable lines, 'a' and 'b' being the parameters connected by the relation $a^2 + b^2 = ab$. The locus of the point of intersection has the equation
(A) $x^2 + y^2 + xy - 1 = 0$ (B) $x^2 + y^2 - xy + 1 = 0$
(C) $x^2 + y^2 + xy + 1 = 0$ (D) $x^2 + y^2 - xy - 1 = 0$

Q.55 If $\left(a, \frac{1}{a}\right), \left(b, \frac{1}{b}\right), \left(c, \frac{1}{c}\right)$ and $\left(d, \frac{1}{d}\right)$ are four distinct points on a circle of radius 4 units then, abcd is equal to
(A) 4 (B) 1/4 (C) 1 (D) 16

Q.56 Triangle formed by the lines $x + y = 0$, $x - y = 0$ and $lx + my = 1$. If l and m vary subject to the condition $l^2 + m^2 = 1$ then the locus of its circumcentre is
(A) $(x^2 - y^2)^2 = x^2 + y^2$ (B) $(x^2 + y^2)^2 = (x^2 - y^2)$
(C) $(x^2 + y^2) = 4x^2 y^2$ (D) $(x^2 - y^2)^2 = (x^2 + y^2)^2$

Q.57 The radical centre of three circles taken in pairs described on the sides of a triangle ABC as diametres is the :
(A) centroid of the ΔABC (B) incentre of the ΔABC
(C) circumcentre o the ΔABC (D) orthocentre of the ΔABC

Q.58 The image of the pair of lines represented by $ax^2 + 2h\,xy + by^2 = 0$ by the line mirror $y = 0$ is
(A) $ax^2 - 2h\,xy - by^2 = 0$ (B) $bx^2 - 2h\,xy + ay^2 = 0$
(C) $bx^2 + 2h\,xy + ay^2 = 0$ (D) $ax^2 - 2h\,xy + by^2 = 0$

Q.59 Two circles are drawn through the points (1, 0) and (2, – 1) to touch the axis of y. They intersect at an angle
(A) $\cot^{-1}\frac{3}{4}$ (B) $\cos^{-1}\frac{4}{5}$ (C) $\frac{\pi}{2}$ (D) $\tan^{-1} 1$

Q.60 Let (x_1, y_1) ; (x_2, y_2) and (x_3, y_3) are the vertices of a triangle ABC respectively. D is a point on BC such that BC = 3BD. The equation of the line through A and D, is

(A) $\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} + 2\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$ (B) $3\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} + \begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$

(C) $\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} + 3\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$ (D) $2\begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} + \begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$

Q.61 A foot of the normal from the point (4, 3) to a circle is (2, 1) and a diameter of the circle has the equation $2x - y - 2 = 0$. Then the equation of the circle is
(A) $x^2 + y^2 - 4y + 2 = 0$ (B) $x^2 + y^2 - 4y + 1 = 0$
(C) $x^2 + y^2 - 2x - 1 = 0$ (D) $x^2 + y^2 - 2x + 1 = 0$

Q.62 If the straight lines, $ax + amy + 1 = 0$, $bx + (m+1)by + 1 = 0$ and $cx + (m+2)cy + 1 = 0$, $m \neq 0$ are concurrent then a, b, c are in :
(A) A.P. only for $m = 1$
(B) A.P. for all m
(C) G.P. for all m
(D) H.P. for all m.

Q.63 AB is a diameter of a circle. CD is a chord parallel to AB and 2 CD = AB. The tangent at B meets the line AC produced at E then AE is equal to :
(A) AB
(B) $\sqrt{2}$ AB
(C) $2\sqrt{2}$ AB
(D) 2 AB

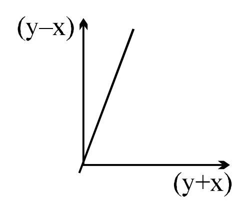
Q.64 If in triangle ABC, $A \equiv (1, 10)$, circumcentre $\equiv \left(-\frac{1}{3}, \frac{2}{3}\right)$ and orthocentre $\equiv \left(\frac{11}{3}, \frac{4}{3}\right)$ then the co-ordinates of mid-point of side opposite to A is :
(A) $(1, -11/3)$
(B) $(1, 5)$
(C) $(1, -3)$
(D) $(1, 6)$

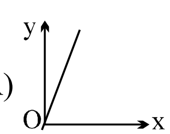
Q.65 A circle of constant radius 'a' passes through origin 'O' and cuts the axes of co–ordinates in points P and Q, then the equation of the locus of the foot of perpendicular from O to PQ is :
(A) $(x^2 + y^2)\left(\frac{1}{x^2} + \frac{1}{y^2}\right) = 4a^2$
(B) $(x^2 + y^2)^2\left(\frac{1}{x^2} + \frac{1}{y^2}\right) = a^2$
(C) $(x^2 + y^2)^2\left(\frac{1}{x^2} + \frac{1}{y^2}\right) = 4a^2$
(D) $(x^2 + y^2)\left(\frac{1}{x^2} + \frac{1}{y^2}\right) = a^2$

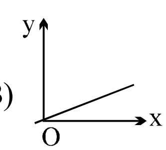
Q.66 A is a point on either of two lines $y + \sqrt{3}\,|x| = 2$ at a distance of $\frac{4}{\sqrt{3}}$ units from their point of intersection. The co-ordinates of the foot of perpendicular from A on the bisector of the angle between them are
(A) $\left(-\frac{2}{\sqrt{3}}, 2\right)$
(B) $(0, 0)$
(C) $\left(\frac{2}{\sqrt{3}}, 2\right)$
(D) $(0, 4)$

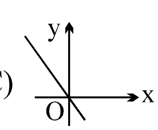
Q.67 If a circle of constant radius 3k passes through the origin 'O' and meets co-ordinate axes at A and B then the locus of the centroid of the triangle OAB is
(A) $x^2 + y^2 = (2k)^2$
(B) $x^2 + y^2 = (3k)^2$
(C) $x^2 + y^2 = (4k)^2$
(D) $x^2 + y^2 = (6k)^2$

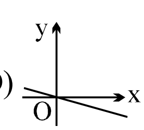
Q.68 The graph of $(y - x)$ against $(y + x)$ is as shown.
Which one of the following shows the graph of y against x?



(A) 

(B) 

(C) 

(D) 

Q.69 A circle is drawn touching the x–axis and centre at the point which is the reflection of (a, b) in the line $y - x = 0$. The equation of the circle is
(A) $x^2 + y^2 - 2bx - 2ay + a^2 = 0$
(B) $x^2 + y^2 - 2bx - 2ay + b^2 = 0$
(C) $x^2 + y^2 - 2ax - 2by + b^2 = 0$
(D) $x^2 + y^2 - 2ax - 2by + a^2 = 0$

Q.70 P is a point inside the triangle ABC. Lines are drawn through P, parallel to the sides of the triangle. The three resulting triangles with the vertex at P have areas 4, 9 and 49 sq. units. The area of the triangle ABC is
(A) $2\sqrt{3}$
(B) 12
(C) 24
(D) 144

Q.71 The locus of the mid–points of the chords of the circle $x^2 + y^2 - 2x - 4y - 11 = 0$ which subtend 60^0 at the centre is
(A) $x^2 + y^2 - 4x - 2y - 7 = 0$ (B) $x^2 + y^2 + 4x + 2y - 7 = 0$
(C) $x^2 + y^2 - 2x - 4y - 7 = 0$ (D) $x^2 + y^2 + 2x + 4y + 7 = 0$

Q.72 Let PQR be a right angled isosceles triangle, right angled at P (2, 1). If the equation of the line QR is $2x + y = 3$, then the equation representing the pair of lines PQ and PR is
(A) $3x^2 - 3y^2 + 8xy + 20x + 10y + 25 = 0$ (B) $3x^2 - 3y^2 + 8xy - 20x - 10y + 25 = 0$
(C) $3x^2 - 3y^2 + 8xy + 10x + 15y + 20 = 0$ (D) $3x^2 - 3y^2 - 8xy - 10x - 15y - 20 = 0$

Q.73 A line meets the co-ordinate axes in A and B. A circle is circumscribed about the triangle OAB. If d_1 and d_2 are the distances of the tangent to the circle at the origin O from the points A and B respectively, the diameter of the circle is :
(A) $\frac{2d_1 + d_2}{2}$ (B) $\frac{d_1 + 2d_2}{2}$ (C) $d_1 + d_2$ (D) $\frac{d_1 d_2}{d_1 + d_2}$

Q.74 Let $f(x) = mx + b$ where m and b are integers with $m > 0$. If the solution of the equation $2^{f(x)} = 5$ is $x = \log_8 10$ then $(m + b)$ has the value equal to
(A) 1 (B) 2 (C) 3 (D) 4

Q.75 The equation of the circle symmetric to the circle $x^2 + y^2 - 2x - 4y + 4 = 0$ about the line $x - y = 3$ is
(A) $x^2 + y^2 - 10x + 4y + 28 = 0$ (B) $x^2 + y^2 + 6x + 8 = 0$
(C) $x^2 + y^2 - 14x - 2y + 49 = 0$ (D) $x^2 + y^2 + 8x + 2y + 16 = 0$

Q.76 If the straight lines joining the origin and the points of intersection of the curve

$$5x^2 + 12xy - 6y^2 + 4x - 2y + 3 = 0 \text{ and } x + ky - 1 = 0$$

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 .

Q.77 A variable circle C has the equation

$$x^2 + y^2 - 2(t^2 - 3t + 1)x - 2(t^2 + 2t)y + t = 0, \quad \text{where t is a parameter.}$$

If the power of point P(a,b) w.r.t. the circle C is constant then the ordered pair (a, b) is
(A) $\left(\frac{1}{10}, -\frac{1}{10}\right)$ (B) $\left(-\frac{1}{10}, \frac{1}{10}\right)$ (C) $\left(\frac{1}{10}, \frac{1}{10}\right)$ (D) $\left(-\frac{1}{10}, -\frac{1}{10}\right)$

Q.78 The line $(k + 1)^2x + ky - 2k^2 - 2 = 0$ passes through a point regardless of the value k. Which of the following is the line with slope 2 passing through the point?
(A) $y = 2x - 8$ (B) $y = 2x - 5$ (C) $y = 2x - 4$ (D) $y = 2x + 8$

Q.79 A straight line l_1 with equation $x - 2y + 10 = 0$ meets the circle with equation $x^2 + y^2 = 100$ at B in the first quadrant. A line through B, perpendicular to l_1 cuts the y-axis at P (0, t). The value of 't' is
(A) 12 (B) 15 (C) 20 (D) 25

Q.80 Point 'P' lies on the line l $\{(x, y) \mid 3x + 5y = 15\}$. If 'P' is also equidistant from the coordinate axes, then P can be located in which of the four quadrants.
(A) I only (B) II only (C) I or II only (D) IV only

Q.81 If the line $y = mx$ bisects the angle between the lines $ax^2 + 2h\,xy + by^2 = 0$ then m is a root of the quadratic equation :

(A) $hx^2 + (a - b)\,x - h = 0$ (B) $x^2 + h\,(a - b)\,x - 1 = 0$

(C) $(a - b)\,x^2 + hx - (a - b) = 0$ (D) $(a - b)\,x^2 - hx - (a - b) = 0$

Q.82 An equilateral triangle has each of its sides of length 6 cm . If (x_1, y_1) ; (x_2, y_2) and (x_3, y_3) are its vertices then the value of the determinant,

$$\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}^2 \text{ is equal to :}$$

(A) 192 (B) 243 (C) 486 (D) 972

Q.83 A graph is defined in polar co-ordinates as $r(\theta) = \cos\theta + \frac{1}{2}$. The smallest x-coordinates of any point on the graph is

(A) $-\frac{1}{16}$ (B) $-\frac{1}{8}$ (C) $-\frac{1}{4}$ (D) $-\frac{1}{2}$

Q.84 If the vertices A and B of a triangle ABC are given by $(2, 5)$ and $(4, -11)$ respectively and C moves along the line $L \equiv 9x + 7y + 4 = 0$, then the locus of the centroid of the triangle ABC is :

(A) a circle (B) any straight line

(C) a line parallel to L (D) a line perpendicular to L .

[REASONING TYPE]

Q.85 Passing through a point A(6, 8) a variable secant line L is drawn to the circle S : $x^2 + y^2 - 6x - 8y + 5 = 0$. From the point of intersection of L with S, a pair of tangent lines are drawn which intersect at P.

Statement-1: Locus of the point P has the equation $3x + 4y - 40 = 0$.

because

Statement-2: Point A lies outside the circle.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.86 Consider the lines, $L_1 : \frac{x}{3} + \frac{y}{4} = 1$; $L_2 = \frac{x}{4} + \frac{y}{3} = 1$; $L_3 : \frac{x}{3} + \frac{y}{4} = 2$ and $L_4 : \frac{x}{4} + \frac{y}{3} = 2$

Statement-1: The quadrilateral formed by these four lines is a rhombus.

because

Statement-2: If diagonals of a quadrilateral formed by any four lines are unequal and intersect at right angle then it is a rhombus.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.87 Given the lines $y + 2x = 3$ and $y + 2x = 5$ cut the axes at A, B and C, D respectively.

Statement-1 : ABDC forms quadrilateral and point (2, 3) lies inside the quadrilateral

because

Statement-2 : Point lies on same side of the lines.

(A) Statement-1 is True, Statement-2 is True ; Statement-2 **is** a 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

Q.88 Consider the circles, $S_1 : x^2 + y^2 + 2x - 4 = 0$ and $S_2 : x^2 + y^2 - y + 1 = 0$

Statement-1: Tangents from the point P(0, 5) on S_1 and S_2 are equal.

because

Statement-2: Point P(0, 5) lies on the radical axis of the two circles.

(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 the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.89 Statement-1: Centroid of the triangle whose vertices are A(–1, 11); B(– 9, – 8) and C(15, – 2) lies on the internal angle bisector of the vertex A.

because

Statement-2: Triangle ABC is isosceles with B and C as base angles.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.90 Consider the following statements

Statement-1: The equation $x^2 + 2y^2 - 2\sqrt{3}\,x - 4y + 5 = 0$ represents two real lines on the cartesian plane.

because

Statement-2: A general equation of degree two

$$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$$

denotes a line pair if

$$abc + 2fgh - af^2 - bg^2 - ch^2 = 0$$

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.91 Let C be a circle with centre 'O' and HK is the chord of contact of pair of the tangents from point A. OA intersects the circle C at P and Q and B is the midpoint of HK, then

Statement-1 : AB is the harmonic mean of AP and AQ.

because

Statement-2 : AK is the Geometric mean of AB and AO and OA is the arithmetic mean of AP and AQ.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.92 Consider a triangle whose vertices are $A(-2, 1)$, $B(1, 3)$ and $C(3x, 2x-3)$ where x is a real number.
Statement-1 : The area of the triangle ABC is independent of x
because
Statement-2 : The vertex C of the triangle ABC always moves on a line parallel to the base AB.
(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.93 Given a ΔABC whose vertices are $A(x_1, y_1)$; $B(x_2, y_2)$; $C(x_3, y_3)$.
Let there exists a point P(a, b) such that $6a = 2x_1 + x_2 + 3x_3$; $6b = 2y_1 + y_2 + 3y_3$
Statement-1: Area of triangle PBC must be less than the area of ΔABC
because
Statement-2: P lies inside the triangle ABC
(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.94 Let C_1 denotes a family of circles with centre on x-axis and touching the y-axis at the origin.
and C_2 denotes a family of circles with centre on y-axis and touching the x-axis at the origin.
Statement-1: Every member of C_1 intersects any member of C_2 at right angles at the point other than origin.
because
Statement-2: If two circles intersect at 90° at one point of their intersection, then they must intersect at 90° on the other point of intersection also.
(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.95 Let points A, B, C are represented by $(a \cos \theta_i, a \sin \theta_i)$ $i = 1, 2, 3$ and

$$\cos(\theta_1 - \theta_2) + \cos(\theta_2 - \theta_3) + \cos(\theta_3 - \theta_1) = -\frac{3}{2}.$$

Statement-1 : Orthocentre of Δ ABC is at origin
because
Statement-2: Δ ABC is equilateral triangle.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.96 Consider the line L: $= 3x + y + 4 = 0$ and the points $A(-5, 6)$ and $B(3, 2)$
Statement-1: There is exactly one point on the line L which is equidistant from the point A and B.
because
Statement-2: The point A and B are on the different sides of the line.
(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
(C) Statement-1 is true, statement-2 is false.
(D) Statement-1 is false, statement-2 is true.

Q.97 **Statement-1:** Only one normal can be drawn through the point P(2, –3) to the circle $x^2 + y^2 - 4x + 8y - 16 = 0$

because

Statement-2: Passing through any point lying inside a given circle only one normal can be drawn.

(A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.

(B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.

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

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

[COMPREHENSION TYPE]

Paragraph for Question Nos. 98 to 100

Let C be a circle of radius *r* with centre at O. Let P be a point outside C and D be a point on C. A line through P intersects C at Q and R, S is the midpoint of QR.

Q.98 For different choices of line through P, the curve on which S lies, is

(A) a straight line
(B) an arc of circle with P as centre
(C) an arc of circle with PS as diameter
(D) an arc of circle with OP as diameter

Q.99 Let P is situated at a distance 'd' from centre O, then which of the following does not equal the product (PQ) (PR)?

(A) $d^2 - r^2$
(B) PT^2, where T is a point on C and PT is tangent to C
(C) $(PS)^2 - (QS)(RS)$
(D) $(PS)^2$

Q.100 Let XYZ be an equilateral triangle inscribed in C. If α, β, γ denote the distances of D from vertices X, Y, Z respectively, the value of product $(\beta + \gamma - \alpha)(\gamma + \alpha - \beta)(\alpha + \beta - \gamma)$, is

(A) 0
(B) $\frac{\alpha\beta\gamma}{8}$
(C) $\frac{\alpha^3 + \beta^3 + \gamma^3 - 3\alpha\beta\gamma}{6}$
(D) None of these

Paragraph for Question Nos. 101 to 103

The base of an isosceles triangle is equal to 4, the base angle is equal to 45°. A straight line cuts the extension of the base at a point M at the angle θ and bisects the lateral side of the triangle which is nearest to M.

Q.101 The area 'A' of the quadrilateral which the straight line cuts off from given triangle is

(A) $\frac{3 + \tan\theta}{1 + \tan\theta}$
(B) $\frac{3 + 2\tan\theta}{1 + \tan\theta}$
(C) $\frac{3 + \tan\theta}{1 - \tan\theta}$
(D) $\frac{3 + 5\tan\theta}{1 + \tan\theta}$

Q.102 The range of values of 'A' for different values of θ, lie in the interval,

(A) $\left(\frac{5}{2}, \frac{7}{2}\right)$
(B) (4, 5)
(C) $\left(4, \frac{9}{2}\right)$
(D) (3, 4)

Q.103 The length of portion of straight line inside the triangle may lie in the range :

(A) (2, 4)
(B) $\left(\frac{3}{2}, \sqrt{3}\right)$
(C) $(\sqrt{2}, 2)$
(D) $(\sqrt{2}, \sqrt{3})$

Paragraph for Question Nos. 104 to 106

Consider a line pair $ax^2 + 3xy - 2y^2 - 5x + 5y + c = 0$ representing perpendicular lines intersecting each other at C and forming a triangle ABC with the x-axis.

Q.104 If x_1 and x_2 are intercepts on the x-axis and y_1 and y_2 are the intercepts on the y-axis then the sum $(x_1 + x_2 + y_1 + y_2)$ is equal to
(A) 6 (B) 5 (C) 4 (D) 3

Q.105 Distance between the orthocentre and circumcentre of the triangle ABC is
(A) 2 (B) 3 (C) 7/4 (D) 9/4

Q.106 If the circle $x^2 + y^2 - 4y + k = 0$ is orthogonal with the circumcircle of the triangle ABC then 'k' equals
(A) 1/2 (B) 1 (C) 2 (D) 3/2

Paragraph for Question Nos. 107 to 109

Consider a family of lines $(4a + 3)x - (a + 1)y - (2a + 1) = 0$ where $a \in R$

Q.107 The locus of the foot of the perpendicular from the origin on each member of this family, is
(A) $(2x - 1)^2 + 4(y + 1)^2 = 5$ (B) $(2x - 1)^2 + (y + 1)^2 = 5$
(C) $(2x + 1)^2 + 4(y - 1)^2 = 5$ (D) $(2x - 1)^2 + 4(y - 1)^2 = 5$

Q.108 A member of this family with positive gradient making an angle of $\pi/4$ with the line $3x - 4y = 2$, is
(A) $7x - y - 5 = 0$ (B) $4x - 3y + 2 = 0$ (C) $x + 7y = 15$ (D) $5x - 3y - 4 = 0$

Q.109 Minimum area of the triangle which a member of this family with negative gradient can make with the positive semi axes, is
(A) 8 (B) 6 (C) 4 (D) 2

[MULTIPLE OBJECTIVE TYPE]

Q.110 All the points lying inside the triangle formed by the points (1, 3), (5, 6) and (– 1, 2) satisfy
(A) $3x + 2y \geq 0$ (B) $2x + y + 1 \geq 0$ (C) $2x + 3y - 12 \geq 0$ (D) $-2x + 11 \geq 0$

Q.111 A family of linear functions is given by $f(x) = 1 + c(x + 3)$ where $c \in R$. If a member of this family meets a unit circle centred at origin in two coincident points then 'c' can be equal to
(A) – 3/4 (B) 0 (C) 3/4 (D) 1

Q.112 Two vertices of the ΔABC are at the points A(– 1, – 1) and B(4, 5) and the third vertex lines on the straight line $y = 5(x - 3)$. If the area of the Δ is 19/2 then the possible co–ordinates of the vertex C are:
(A) (5, 10) (B) (3, 0) (C) (2, – 5) (D) (5, 4)

Q.113 $\frac{x - x_1}{\cos\theta} = \frac{y - y_1}{\sin\theta} = r$, represents :
(A) equation of a straight line, if θ is constant and r is variable
(B) equation of a circle, if r is constant and θ is a variable
(C) a straight line passing through a fixed point and having a known slope
(D) a circle with a known centre and a given radius.

Q.114 If $\frac{x}{c} + \frac{y}{d} = 1$ is a line through the intersection of $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{b} + \frac{y}{a} = 1$ and the lengths of the perpendiculars drawn from the origin to these lines are equal in lengths then :
(A) $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2} + \frac{1}{d^2}$ (B) $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c^2} - \frac{1}{d^2}$
(C) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c} + \frac{1}{d}$ (D) none

Q.115 Consider the circles $S_1 : x^2+y^2=4$ and $S_2 : x^2+y^2-2x-4y+4=0$ which of the following statements are correct?

(A) Number of common tangents to these circles is 2.

(B) If the power of a variable point P w.r.t. these two circles is same then P moves on the line $x+2y-4=0$.

(C) Sum of the y-intercepts of both the circles is 6.

(D) The circles S_1 and S_2 are orthogonal.

Q.116 A and B are two fixed points whose co-ordinates are (3, 2) and (5, 4) respectively. The co-ordinates of a point P if ABP is an equilateral triangle, is/are :

(A) $\left(4-\sqrt{3}, 3+\sqrt{3}\right)$ (B) $\left(4+\sqrt{3}, 3-\sqrt{3}\right)$ (C) $\left(3-\sqrt{3}, 4+\sqrt{3}\right)$ (D) $\left(3+\sqrt{3}, 4-\sqrt{3}\right)$

Q.117 Point M moved along the circle $(x-4)^2+(y-8)^2=20$. Then it broke away from it and moving along a tangent to the circle, cuts the x–axis at the point $(-2, 0)$. The co–ordinates of the point on the circle at which the moving point broke away can be :

(A) $\left(-\frac{3}{5}, \frac{46}{5}\right)$ (B) $\left(-\frac{2}{5}, \frac{44}{5}\right)$ (C) (6, 4) (D) (3, 5)

Q.118 Straight lines $2x+y=5$ and $x-2y=3$ intersect at the point A. Points B and C are chosen on these two lines such that $AB=AC$. Then the equation of a line BC passing through the point (2, 3) is

(A) $3x-y-3=0$ (B) $x+3y-11=0$

(C) $3x+y-9=0$ (D) $x-3y+7=0$

Q.119 Consider the circles

$S_1 : x^2+y^2+2x+4y+1=0$

$S_2 : x^2+y^2-4x+3=0$

$S_3 : x^2+y^2+6y+5=0$

Which of this following statements are correct?

(A) Radical centre of S_1, S_2 and S_3 lies in 1^{st} quadrant.

(B) Radical centre of S_1, S_2 and S_3 lies in 4^{th} quadrants.

(C) Radius of the circle intersecting S_1, S_2 and S_3 orthogonally is 1.

(D) Circle orthogonal to S_1, S_2 and S_3 has its x and y intercept equal to zero.

Q.120 The straight lines $x+y=0$, $3x+y-4=0$ and $x+3y-4=0$ form a triangle which is

(A) isosceles (B) right angled (C) obtuse angled (D) equilateral

Q.121 Locus of the intersection of the two straight lines passing through (1, 0) and (–1, 0) respectively and including an angle of 45° can be a circle with

(A) centre (1, 0) and radius $\sqrt{2}$. (B) centre (1, 0) and radius 2.

(C) centre (0, 1) and radius $\sqrt{2}$. (D) centre (0, – 1) and radius $\sqrt{2}$.

Q.122 The x-coordinates of the vertices of a square of unit area are the roots of the equation $x^2-3|x|+2=0$ and the y-coordinates of the vertices are the roots of the equation $y^2-3y+2=0$ then the possible vertices of the square is/are :

(A) (1, 1), (2, 1), (2, 2), (1, 2) (B) (– 1, 1), (– 2, 1), (– 2, 2), (– 1, 2)

(C) (2, 1), (1, – 1), (1, 2), (2, 2) (D) (– 2, 1), (– 1, – 1), (– 1, 2), (– 2, 2)

ANSWERKEY

[STRAIGHT OBJECTIVE TYPE]

Q.1 D	Q.2 A	Q.3 A	Q.4 B	Q.5 A	Q.6 C	Q.7 A
Q.8 C	Q.9 B	Q.10 D	Q.11 D	Q.12 D	Q.13 D	Q.14 C
Q.15 A	Q.16 B	Q.17 A	Q.18 B	Q.19 B	Q.20 C	Q.21 A
Q.22 B	Q.23 B	Q.24 A	Q.25 D	Q.26 C	Q.27 D	Q.28 A
Q.29 D	Q.30 A	Q.31 A	Q.32 D	Q.33 B	Q.34 C	Q.35 C
Q.36 B	Q.37 A	Q.38 B	Q.39 B	Q.40 B	Q.41 C	Q.42 D
Q.43 D	Q.44 D	Q.45 C	Q.46 C	Q.47 B	Q.48 A	Q.49 B
Q.50 B	Q.51 D	Q.52 C	Q.53 D	Q.54 A	Q.55 C	Q.56 A
Q.57 D	Q.58 D	Q.59 A	Q.60 D	Q.61 C	Q.62 D	Q.63 D
Q.64 A	Q.65 C	Q.66 B	Q.67 A	Q.68 C	Q.69 B	Q.70 D
Q.71 C	Q.72 B	Q.73 C	Q.74 B	Q.75 A	Q.76 B	Q.77 B
Q.78 A	Q.79 C	Q.80 C	Q.81 A	Q.82 D	Q.83 A	Q.84 C

[REASONING TYPE]

Q.85 D	Q.86 C	Q.87 D	Q.88 A	Q.89 A	Q.90 D	Q.91 A
Q.92 A	Q.93 A	Q.94 A	Q.95 A	Q.96 B	Q.97 C	

[COMPREHENSION TYPE]

Q.98 D	Q.99 D	Q.100 A	Q.101 D	Q.102 D	Q.103 C	Q.104 B
Q.105 C	Q.106 D	Q.107 D	Q.108 A	Q.109 C		

[MULTIPLE OBJECTIVE TYPE]

Q.110 A, B, D	Q.111 A, B	Q.112 A, B	Q.113 A, B, C, D
Q.114 A, C	Q.115 A, B, D	Q.116 A, B	Q.117 B, C
Q.118 A, B	Q.119 B, C, D	Q.120 A, C	Q.121 C, D
Q.122 A, C			