Q.1 From any point on a hyperbola $xy = c^2$ tangents are drawn to another hyperbola $xy = a^2$ which has the same asymptotes. Then the chord of contact cuts off a constant area from the asymptotes:

(A) $\frac{2a^2}{c^2}$ (B) $\frac{a^2}{c^2}$

(C) $\frac{2c^2}{a^2}$ (D) $\frac{c^2}{a^2}$

Q.2 A rectangular hyperbola $xy = c^2$ (c is purely imaginary) if a point on it is (a, α) where 'a' is a positive number, α can take value-

(A) 3 (B) $\frac{1-\sqrt{3}}{2}$

(C) 17 (D) 3/2

Q.3 The locus of point of intersection of the lines $\sqrt{3}x - y - 4\sqrt{3}k = 0$ and $\sqrt{3}kx + ky - 4\sqrt{3} = 0$ represent a hyperbola then its eccentricity equals -

(A) $\sqrt{2}$ (B) 2 (C) $\sqrt{7}$ (D) $\sqrt{5}$

Q.4 If there are two points A and B on rectangular hyperbola $xy = c^2$ such that abscissa of A = ordinate of B, then locus of point of intersection of tangents at A & B is -

(A) $y^2 - x^2 = 2c^2$ (B) $y^2 - x^2 = \frac{c^2}{2}$

(C) $y = x$ (D) None of these

Q.5 Let PQ be a double ordinate of hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. If O be the centre of the hyperbola and OPQ is an equilateral triangle then the eccentricity e is -

(A) > $\sqrt{3}$ (B) > 2

(C) > 2/ $\sqrt{3}$ (D) None of these

Q.6 If a variable straight line x cos α + y sin α = p which is chord of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}$ = 1(b>a) subtend a right angle at the centre of hyperbola, then it always touches a fixed circle whose radius is equal to -

(A) $\frac{ab}{a^2+b^2}$ (B) $\frac{ab}{\sqrt{b^2-a^2}}$

(C) $\frac{ab}{\sqrt{a^2+b^2}}$ (D) None of these

Q.7 A point P moves in such a way that the sum of the slopes of the normals drawn from itto the hyperbola xy = 4 is equal to the sum of the ordinates of feet of the normals. The locus of P is a parabola x^2 = 4y. Then the least distance of this parabola from the circle $x^2 - y^2 - 24x + 128 = 0$ is -

(A) 4 $\sqrt{5}$ (B) $\frac{4}{\sqrt{5}}$

(C) $-4\sqrt{5}$ (D) None of these

Q.8 Equation of the chord of the hyperbola $25x^2 - 16y^2 = 400$ which is bisected at the point (6, 2), is -

(A) 16x – 75y = 418 (B) 75x – 16y = 418

(C) 25x – 4y = 400 (D) None of these

Q.9 Let A and B be two fixed points and P, another point in the plane, moves in such a way that $k_1PA + k_2PB = k_3$, where k_1, k_2 and k_3 are real constants. Then which one of the following is not the locus of P -

(A) a circle, if $k_1 = 0$ and $k_2, k_3 > 0$

(B) a circle, if $k_1 > 0$ and $k_2 < 0$ and $k_3 = 0$

(C) an ellipse, if $k_1 = k_2 > 0$ and $k_3 > 0$

(D) an hyperbola, if $k_2 = -1$ and $k_1, k_3 > 0$

Q.10 The coordinates of the point of intersection of two tangents to a rectangular hyperbola referred to its asymptote as axes are -

(A) Geometric means between the coordinates of the point of contact

(B) Arithmetic means between the coordinates of the point of contact

(C) Harmonic means between the coordinates of the point of contact

(D) None of the above

Q.11 C is the centre of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. The tangent at any point P on this hyperbola meets the straight line $bx - ay = 0$ and $bx + ay = 0$ in the points Q and R respectively then value of CQ . CR -

(A) a^2 (B) b^2

(C) $a^2 + b^2$ (D) None of these

Q.12 The straight line $x + y = \sqrt{2}p$ will touch the hyperbola $4x^2 - 9y^2 = 36$, if

(A) $p^2 = 2$ (B) $p^2 = 5$

(C) $5p^2 = 2$ (D) $2p^2 = 5$

ANSWER KEY

Qus.	1	2	3	4	5	6	7	8	9	10	11	12
Ans.	A	B	B	C	C	B	A	B	D	C	C	D