Single Correct Answer Type

1. If the algebraic sum of distances of points (2, 1) (3, 2) and (-4, 7) from the line $y = mx + c$ is zero, then this line will always pass through a fixed point whose coordinate is

   (A) (1, 10) (B) (1, 3) (C) (1, 6) (D) (1/3, 10/3)

2. The sides of a triangle are x + y = 1, 7y = x and $\sqrt{3}y + x = 0$. Then which of the following is an exterior point of the triangle?

   (A) orthocentre (B) centroid (C) In-centre (D) none of these

3. ABC is an equilateral triangle such that the vertices B and C lie on two parallel lines at a distance 6. If A lies between the parallel lines at a distance 4 from one of them then the length of a side of the equilateral triangle is

   (A) 8 (B) $\sqrt{88/3}$ (C) $4\sqrt{\frac{7}{3}}$ (D) 1

4. The equation of the bisector of the acute angle between the lines 2x – y + 4 = 0 and x – 2y = 1

   (A) x + y + 5 = 0 (B) x – y + 1 = 0 (C) x – y = 5 (D) x + y + 1 = 0

5. A ray of light is sent along the line which passes through the point (2, 3). The ray is reflected from the point P on x-axis. If the reflected ray passes through the point (6, 4), then the coordinates of P are

   (A) $\left(\frac{26}{7},0\right)$ (B) $\left(\frac{-26}{7},0\right)$ (C) $\left(\frac{13}{7},0\right)$ (D) $\left(\frac{-13}{7},0\right)$

6. The point $(2t^2 + 2t + 4, t^2 + t + 1)$ lies on the line x + 2y = 1, for

   (A) All real values of t (B) Some real values of t

   (C) $t = \frac{-4 \pm \sqrt{7}}{8}$ (D) for no value of t

7. Consider a family of straight lines (x + y) + λ (2x – y + 1) = 0. Equation of the straight line belonging to this family that is farthest form (1, –3) is

   (A) 13y + 6x = 7 (B) 15y + 6x = 7 (C) 13y – 6x = 7 (D) 15y – 6x = 7

8. The distance of the line 2x – 3y = 4 from the point (1, 1) in the direction of the line x + y=1is

   (A) $\sqrt{2}$ (B) $5\sqrt{2}$ (C) $1/\sqrt{2}$ (D) none of these

9. If $x^2 – 7xy – y^2 = 0$, x + y = 2 , represents the sides of a triangle, then distance between orthocenter and the side of triangle is

   (A) 2 (B) √3 (C) √2 (D) $\frac{1}{\sqrt{2}}$

10. If the line $\sqrt{5}$ x = y meets the lines x = 1, x = 2… x = n, at points A_1, A_2,…. A_n respectively then $(OA_1)^2$ + $(OA_2)^2$ …. + $(OA_n)^2$ is equal to

    (A) $3n^2 + 3n$ (B) $2n^3 + 3n^2 + n$ (C) $3n^3 + 3n^2 + 2$ (D) (3/2) $(n^4 + 2n^3 + n^2)$

11. The pair of lines $x^2 – 2pxy – y^2 = 0$ and $x^2 – 2qxy – y^2 = 0$ such that each pair bisect the angle between the other, the pq=

    (A) 1 (B) 0 (C) –1 (D) none of these

12. If the equation of the pair of straight lines passing through the point (1, 1) making complementary angle with the positive direction of x–axis is $x^2-(a+2)xy+y^2+a(x+y-1)=0, a\neq -2$. If one of the angles is θ then the value of $\sin 2\theta$ is

(A) a – 2 (B) a + 2 (C) $2/(a+2)$ (D) $\frac{2}{a}$

13. The minimum distance of $4x^2 + y^2 + 4x - 4y + 5 = 0$ from the line $-4x + 3y = 3$ is

(A) 2 (B) 3 (C) 1 (D) none of these

14. A line through the origin divides parallelogram with vertices (10, 45), (10, 114), (28, 153) and (28, 84) into two congruent pieces. The slope of the line is

(A) $\frac{19}{99}$ (B) $\frac{99}{19}$ (C) $\frac{9}{19}$ (D) $\frac{19}{9}$

15. The straight lines joining the origin to the points of intersection of the straight line hx + ky = 2hk and the curve $(x - k)^2 + (y - h)^2 = c^2$ are at right angles then

(A) $h^2 + k^2 + c^2 = 0$ (B) $h^2 - k^2 - c^2 = 0$ (C) $h^2 + k^2 - c^2 = 0$ (D) none of these

16. If two vertices of an equilateral triangle have integral coordinates then the third vertex will have

(A) integral coordinates (B) coordinates which are rational

(C) at least one coordinate irrational (D) coordinates which are irrational

17. If $P(1 + t/\sqrt{2})$ be any point on a line then the range of values of t for which the point P lies between the parallel lines x + 2y = 1 and 2x + 4y = 15 is

(A) $-\frac{4\sqrt{2}}{5} < t < \frac{5\sqrt{2}}{6}$ (B) $0 < t < \frac{5\sqrt{2}}{6}$ (C) $-\frac{4\sqrt{2}}{5} < t < 0$ (D) none of these

18. If a, c, b are in GP then the line ax + by + c = 0

(A) has a fixed direction

(B) always passes through a fixed point

(C) forms a triangle with the axes whose area is constant

(D) always cuts intercepts on the axes such that their sum is zero

19. If $A(\sin\alpha, 1/\sqrt{2})$ and $B(1/\sqrt{2}, \cos\alpha)$, $-\pi \le \alpha \le \pi$, are two point on the same side of the line x – y = 0 then α belongs to the interval

(A) $\left(-\frac{\pi}{4},\frac{\pi}{4}\right)\cup\left(\frac{\pi}{4},\frac{3\pi}{4}\right)$ (B) $\left(-\frac{\pi}{4},\frac{\pi}{4}\right)$ (C) $\left(\frac{\pi}{4},\frac{3\pi}{4}\right)$ (D) none of these

20. ABC is an isosceles triangle in which A is (-1, 0), $\angle A = 2\pi/3$, AB = AC and AB is along the x-axis. If BC = $4\sqrt{3}$ then the equation of the line BC is

(A) $x+\sqrt{3}y=3$ (B) $\sqrt{3}x+y=3$ (C) $x+y=\sqrt{3}$ (D) none of these

Numerical based

21. If the line $y=\sqrt{3}x$ cuts the curve $x^3 + ax^2 + bx - 72 = 0$ at A, B and C, then OA. OB.OC (Where 'O' is origin) is

22. If the straight lines $ax+by+P=0$ and $x\cos\alpha+y\sin\alpha=P$ are inclined at an angle $\frac{\pi}{4}$ and concurrent with straight line $x\sin\alpha - y\cos\alpha = 0$, then the value of $a^2 + b^2$ is

23. P (x, y) is called a good point if $x, y \in N$. Total number of good points lying inside the quadrilateral formed by the line $2x + y = 2, x = 0, y = 0$ and $x + y = 5$, is equal to

24. The perpendicular distance between $3x + 4y - 5 = 0$ and $6x + 8y - 45 = 0$ is:

25. A straight line L with negative slop passes through point (8, 2) and cuts positive coordinates axes at point P and Q. As L varies absolute minimum and $y = mx + 7$ meet at Q and R and area of triangle PQR is maximum then value of 3m must be

KEY

1.	D	**2.**	A	**3.**	C	**4.**	B	**5.**	A
6.	D	**7.**	D	**8.**	A	**9.**	C	**10.**	B
11.	C	**12.**	C	**13.**	C	**14.**	B	**15.**	C
16.	C	**17.**	A	**18.**	C	**19.**	A	**20.**	A
21.	576	**22.**	2	**23.**	6	**24.**	3.5	**25.**	6

✻ *Wish You all the Best* ✻