1. The point (4, 1) undergoes the following two transformations successively

I. reflection about the line y = x

II. translation through a distance 2 units along the positive direction of x–axis.

(a*) (3, 4) (b) 4, 3) (c) (– 4, 3) (d) (– 3, 4)

2. The co–ordinates of the points of trisection of the join of the points (– 2, 3), (3, – 1) nearer to (– 2, 3) is

(a*) $\left(-\frac{1}{3},\frac{5}{3}\right)$ (b) $\left(\frac{4}{3},\frac{1}{3}\right)$ (c) $\left(-\frac{1}{3},2\right)$ (d) $\left(\frac{1}{3},\frac{5}{3}\right)$

3. The three vertices of a parallelogram are (a + b, a – b), (2a + b, 2a – b) and (a – b, a + b), the fourth vertex is

(a*) (b, b) (b) (– b, – b) (c) (b, a) (d) none of t hese

4. The equation of the straight line which passes through the point (1, – 2) and cuts of equal intercepts from axes will be

(a) x + y = 1 (b) x – y = 1 (c*) x + y + 1 = 0 (d) x – y – 2 = 0

5. The angle between the lines 2x + 3 = 0 and 3y = 5 is

(a) 0° (b) 30° (c) 60° (d*) 90°

6. If the lines lx + my + n = 0 and px + qy + r = 0 are perpendicular, then

(a) lp – mq = 0 (b*) lp + mp = 0 (c) lm = pq (d) lm + pq = 0

7. If the lines 3x – 4y + 7 = 0 and ax + 6y + 1 = 0 are perpendicular, then a is equal to

(a) 4 (b) 5 (c) 10 (d*) 8

8. The equation of the line passing through (1, 2) and perpendicular to the line x + y + 4 = 0 is

(a) y – x + 1 = 0 (b*) y – x – 1 = 0

(c) y – x + 2 = 0 (d) y – x – 2 = 0

9. The equation of the straight line which is perpendicular to y = x and passes through (3, 2) will be given by

(a) x – y = 5 (b*) x + y = 5 (c) x + y = 1 (d) x – y = 1

10. The equation of the straight line through (4, 0) and parallel to line 2x – 2y – 3 = 0 is

(a) 2x – 2y = 10 (b*) 2x – 2y – 8 = 0

(c) 2x – 2y + 2 = 0 (d) x – y = 4

11. The nearest point on the line 3x – 4y = 25 from the origin is

(a) (– 4, 5) (b*) (3, – 4) (c) (3, 4) (d) (3, 5)

12. The image of the point (– 1, 3) by the line x – y = 0 is

(a*) (3, – 1) (b) (1, – 3) (c) (– 1, – 1) (d) (3, 3)

13. The straight line passing through the point of intersection of the straight lines x – 3y + 1 = 0 and 2x + 5y – 9 = 0 and having infinite slope has the equation

(a*) x = 2 (b) 3x + y – 1 = 0 (c) y = 1 (d) none of these

14. If a, b, c be in A.P. then ax + by + c = 0 represents

(a) a single line (b*) a family of concurrent lines

(c) a family of parallel lines (d) none of these

15. The line (p + 2q)x + (p – 3q)y = p – q for different values of p and q passes through the point

(a) $\left(\frac{3}{2},\frac{5}{2}\right)$ (b) $\left(\frac{2}{5},\frac{2}{5}\right)$ (c) $\left(\frac{3}{5},\frac{3}{5}\right)$ (d*) $\left(\frac{2}{5},\frac{3}{5}\right)$

16. 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 co–ordinates are
(a*) (1, 1) (b) (1, – 1) (c) (– 1, – 1) (d) (0, 1)

17. The lines 2x – 3y = 1, 3x – 4y = 1 and 6x + 4y = 1 represent three straight lines which
(a) are concurrent (b) are parallel
(c*) enclose a right angled triangular region (d) enclose an obtuse angled triangular region

18. The straight lines x + y = 0, 3x + y = 4, x + 3y – 4 = 0 form a triangle which is
(a*) isosceles (b) equilateral (c) right angled (d) none of these

19. The straight line passing through the point of intersection of the straight lines x – 3y + 1 = 0, 2x + 5y – 9 = 0 and having finite slope and at distance 2 units from the origin has the equation
(a*) x = 2 (b) 3x + 4y – 10 = 0 (c) y = 1 (d) none of these

20. The line 3x + 4y – 24 = 0 cuts the x–axis at A and y–axis at B. Then the in–centre of the triangle OAB where O is the origin is
(a) (1, 2) (b*) (2, 2) (c) (12, 12) (d) (2, 12)

21. If $\frac{x}{c}+\frac{y}{d}=1$ be any line through the intersection of line $\frac{x}{a}+\frac{y}{b}=1$, then
(a) $\frac{1}{a}+\frac{1}{d}=\frac{1}{b}+\frac{1}{c}$ (b) $\frac{1}{b}+\frac{1}{d}=\frac{1}{c}+\frac{1}{a}$ (c) $\frac{1}{c}+\frac{1}{d}=\frac{1}{a}+\frac{1}{b}$ (d*) none of these

22. If the lines 3y + 4x = 1, y = x + 5 and 5y + bx = 3 are concurrent then the value of b is
(a*) 1 (b) 3 (c) 6 (d) 0

23. Let the vertices of a triangle be (0, 0), (3, 0) and (0, 4). Its orthocentre is
(a*) (0, 0) (b) $\left(1,\frac{4}{3}\right)$ (c) $\left(\frac{3}{2},2\right)$ (d) none of these

24. PQRS is a rectangle whose sides are parallel to fixed directions. P lies on the x–axis while Q and S lie on the lines x = a and x = – a respectively. Then the locus of R is a
(a) circle (b*) straight line
(c) pair of straight lines (d) none of these

25. Three lines px + qy + r = 0, qx + ry + p = 0 and rx + py + q = 0 are concurrent if
(a*) p + q + r = 0 (b*) $p^2 + q^2 + r^2 = pq + qr + rp$
(c*) $p^3 + q^3 + r^3 = 3pqr$ (d) none of these

26. Given four lines whose equations are x + 2y – 3 = 0, 2x + 3y – 4 = 0, 3x + 4y – 7 = 0 and 4x + 5y – 6 = 0 then
(a) they are all concurrent
(b) they are sides of a quadrilateral
(c*) none of these

27. All points lying inside the triangle formed by the points (1, 3), (5, 0) and (– 1, 2) satisfy
(a*) $3x + 2y \geq 0$ (b) $2x + y - 13 > 0$
(c*) $2x - 3y - 12 \leq 0$ (d) $-2x + y \geq 0$ (e) none of these

28. The length of the perpendicular drawn from the point (1, 2) upon the straight line 3x – 4y + 15 = 0 is
(a) 3 (b*) 2 (c) 4 (d) 1

29. The line L has intercepts a and b on the co–ordinates axes. When keeping the origin fixed, the co–ordinate axes are rotated through a fixed angle, then the same line has intercepts p and q on the rotated axes. Then

(a*) $a^2 + b^2 = p^2 + q^2$

(b) $\frac{1}{a^2}+\frac{1}{b^2}=\frac{1}{p^2}+\frac{1}{q^2}$

(c) $a^2 + p^2 = b^2 + q^2$

(d) $\frac{1}{a^2}+\frac{1}{p^2}=\frac{1}{b^2}+\frac{1}{q^2}$

30. The distance between the lines $3x + 4y = 6$ and $6x + 8y = 15$ is

(a) (3/2) (b*) (3/10) (c) 6 (d) none of these