STRAIGHT LINE ASSIGNMENT

1. For the straight lines given by the equation $(2+k)x+(1+k)y=5+7k$, for different values of *k* which of the following statements is true

(a) Lines are parallel (b) Lines pass through the point (–2, 9)

(c) Lines pass through the point $(2,-9)$ (d) None of these

2. The line joining two points $A(2,0)$, $B(3,1)$ is rotated about A in anti-clockwise direction through an angle of 15^o. The equation of the line in the new position, is

(a) $\sqrt{3}x-y-2\sqrt{3}=0$ (b) $x-\sqrt{3}y-2=0$ (c) $\sqrt{3}x+y-2\sqrt{3}=0$ (d) $x+\sqrt{3}y-2=0$

3. If the slope of a line passing through the point $A(3,2)$ be 3/4 , then the points on the line which are 5 units away from A, are

(a) $(5,5),(-1,-1)$ (b) $(7,5),(-1,-1)$ (c) $(5,7),(-1,-1)$ (d) $(7,5),(1,1)$

4. The equation of a line passing through the point of intersection of the lines $x+5y+7=0$, $3x+2y-5=0$ and perpendicular to the line $7x+2y-5=0$ is given by

(a) $2x-7y-20=0$ (b) $2x+7y-20=0$ (c) $-2x+7y-20=0$ (d) $2x+7y+20=0$

5. Equations of diagonals of square formed by lines $x=0, y=0, x=1$ and $y=1$ are

(a) $y=x, y+x=1$ (b) $y=x, x+y=2$ (c) $2y=x, y+x=\frac{1}{3}$ (d) $y=2x, y+2x=1$

6. If the middle points of the sides BC, CA and AB of the triangle ABC be (1, 3), (5, 7) and (–5, 7), then the equation of the side AB is

(a) $x-y-2=0$ (b) $x-y+12=0$ (c) $x+y-12=0$ (d) None of these

7. Given the four lines with equations $x+2y=3$, $3x+4y=7, 2x+3y=4$ and $4x+5y=6$, then these lines are

(a) Concurrent (b) Perpendicular (c) The sides of a rectangle (d) None of these

8. The equation of straight line passing through (–*a*, 0) and making the triangle with axes of area '*T*', is

(a) $2Tx+a^2y+2aT=0$ (b) $2Tx-a^2y+2aT=0$ (c) $2Tx-a^2y-2aT=0$ (d) None of these

9. The points $A(1,3)$ and $C(5,1)$ are the opposite vertices of rectangle. The equation of line passing through other two vertices and of gradient 2, is

(a) $2x+y-8=0$ (b) $2x-y-4=0$ (c) $2x-y+4=0$ (d) $2x+y+7=0$

10. The intercept cut off from *y*-axis is twice that from *x*-axis by the line and line is passes through (1, 2) then its equation is

(a) $2x+y=4$ (b) $2x+y+4=0$ (c) $2x-y=4$ (d) $2x-y+4=0$

11. The equation of line, which bisect the line joining two points (2, –19) and (6, 1) and perpendicular to the line joining two points (–1, 3) and (5, –1), is

(a) $3x-2y=30$ (b) $2x-y-3=0$ (c) $2x+3y=20$ (d) None of these

12. The vertices of a triangle *OBC* are $(0,0)$, $(-3,-1)$ and $(-1,-3)$ respectively. Then the equation of line parallel to *BC* which is at $\frac{1}{2}$ unit distant from origin and cuts *OB* and *OC*, is

(a) $2x+2y+\sqrt{2}=0$ (b) $2x+2y-\sqrt{2}=0$ (c) $2x-2y+\sqrt{2}=0$ (d) None of these

13. The equation of line whose mid point is (x_1, y_1) in between the axes, is

(a) $\frac{x}{x_1}+\frac{y}{y_1}=2$ (b) $\frac{x}{x_1}+\frac{y}{y_1}=\frac{1}{2}$ (c) $\frac{x}{x_1}+\frac{y}{y_1}=1$ (d) None of these

14. The intercept of a line between the coordinate axes is divided by the point (–5, 4) in the ratio 1:2. The equation of the line will be

(a) $5x-8y+60=0$ (b) $8x-5y+60=0$ (c) $2x-5y+30=0$ (d) None of these

15. The diagonal passing through origin of a quadrilateral formed by $x=0, y=0, x+y=1$ and $6x+y=3$, is

(a) $3x-2y=0$ (b) $2x-3y=0$ (c) $3x+2y=0$ (d) None of these

16. Equation of one of the sides of an isosceles right angled triangle whose hypotenuse is $3x+4y=4$ and the opposite vertex of the hypotenuse is (2, 2), will be

(a) $x-7y+12=0$ (b) $7x+y-12=0$ (c) $x-7y+16=0$ (d) $7x+y+16=0$

17. A line $4x+y=1$ passes through the point $A(2,-7)$ meets the line *BC* whose equation is $3x-4y+1=0$ at the point *B*. The equation to the line *AC* so that $AB=AC$, is

(a) $52x+89y+519=0$ (b) $52x+89y-519=0$ (c) $89x+52y+519=0$ (d) $89x+52y-519=0$

18. Equation of the line which passes through the point (–4, 3) and the portion of the line intercepted between the axes is divided internally in the ratio 5:3 by this point, is

(a) $9x+20y+96=0$ (b) $20x+9y+96=0$ (c) $9x-20y+96=0$ (d) None of these

19. A line is such that its segment between the straight lines $5x-y-4=0$ and $3x+4y-4=0$ is bisected at the point (1, 5), then its equation is

(a) $83x-35y+92=0$ (b) $35x-83y+92=0$ (c) $35x+35y+92=0$ (d) None of these

20. $A(-1,1),\ B(5,3)$ are opposite vertices of a square in *xy*-plane. The equation of the other diagonal (not passing through *A*, *B*) of the square is given by

(a) $x-3y+4=0$ (b) $2x-y+3=0$ (c) $y+3x-8=0$ (d) $x+2y-1=0$

21. The point $P(a,b)$ lies on the straight line $3x+2y=13$ and the point $Q(b,a)$ lies on the straight line $4x-y=5$, then the equation of line PQ is

(a) $x-y=5$ (b) $x+y=5$ (c) $x+y=-5$ (d) $x-y=-5$

22. If $P(1+t/\sqrt{2},2+t/\sqrt{2})$ 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) $-\frac{4\sqrt{2}}{3}<t<\frac{5\sqrt{2}}{6}$ (b) $0<t<\frac{5\sqrt{2}}{6}$ (c) $-\frac{4\sqrt{2}}{3}<t<0$ (d) None of these

23. The equations of the sides AB, BC and CA of the ΔABC are $y-x=2$, $x+2y=1$ and $3x+y+5=0$ respectively. The equation of the altitude through *B* is

(a) $x-3y+1=0$ (b) $x-3y+4=0$ (c) $3x-y+2=0$ (d) None of these

24. One side of a square of length *a* is inclined to the *x*-axis at an angle α with one of the vertices of the square at the origin. The equation of a diagonal of the square is

(a) $y(\cos\alpha-\sin\alpha)=x(\cos\alpha+\sin\alpha)$ (b) $y(\cos\alpha+\sin\alpha)=x(\cos\alpha-\sin\alpha)$

(c) $y(\sin\alpha+\cos\alpha)-x(\sin\alpha-\cos\alpha)=a$ (d) $y(\sin\alpha+\cos\alpha)+x(\sin\alpha-\cos\alpha)=a$

25. Straight lines $3x+4y=5$ and $4x-3y=15$ intersect at the point A. Points *B* and *C* are chosen on these lines such that $AB=AC$. Determine the possible equations of the line *BC* passing through the point (1, 2)

(a) $x-7y+13=0$ and $7x+y=9$ (b) $x+7y+13=0$ and $6x-y=9$

(c) $x-7y+12=0$ and $4x+3y=9$ (d) $x-6y+11=0$ and $7x-y=9$

26. The base *BC* of a triangle *ABC* is bisected at the point (*p*, *q*) and the equations to the sides *AB* and *AC* are respectively $px+qy=1$ and $qx+py=1$. Then the equation to the median through *A* is

(a) $(2pq-1)(px+qy-1)=(p^2+q^2-1)(qx+py-1)$ (b) $(p^2+q^2-1)(px+qy-1)=(2p-1)(qx+py-1)$

(c) $(pq-1)(px+qy-1)=(p^2+q^2-1)(qx+py-1)$ (d) None of these

27. If a variable line drawn through the point of intersection of straight lines $\frac{x}{\alpha}+\frac{y}{\beta}=1$ and $\frac{x}{\beta}+\frac{y}{\alpha}=1$ meets the coordinate axes in *A* and *B*, then the locus of the mid-point of *AB* is

(a) $\alpha\beta(x+y)=xy(\alpha+\beta)$ (b) $\alpha\beta(x+y)=2xy(\alpha+\beta)$ (c) $(\alpha+\beta)(x+y)=2\alpha\beta xy$ (d) None of these

28. Equation of the hour hand at 4 O' clock is

(a) $x-\sqrt{3}y=0$ (b) $\sqrt{3}x-y=0$ (c) $x+\sqrt{3}y=0$ (d) $\sqrt{3}x+y=0$

29. The points (1, 3) and (5, 1) are two opposite vertices of a rectangle. The other two vertices lie on the line $y=2x+c$, then the other vertices and *c* are

(a) $(1,1),(2,3)$ and $c=4$ (b) $(4,4),(2,0)$ and $c=-4$ (c) $(0,0),(5,4)$ and $c=3$ (d) None of these

30. A vertex of equilateral triangle is (2, 3) and equation of opposite side is $x+y=2$, then the equation of one side from rest two is

(a) $y-3=2(x-2)$ (b) $y-3=(2-\sqrt{3})(x-2)$ (c) $y-3=(\sqrt{3}-1)(x-2)$ (d) None of these

31. Coordinates of the vertices of a quadrilateral are (2, –1),(0, 2),(2, 3) and (4, 0) . The angle between its diagonals will be

(a) 90^o (b) 0^o (c) $\tan^{-1}(2)$ (d) $\tan^{-1}\left(\frac{1}{2}\right)$

32. In what direction a line be drawn through the point (1, 2) so that its point of intersection with the line $x+y=4$ is at a distance $\frac{\sqrt{6}}{3}$ from the given point

(a) 30^o (b) 45^o (c) 60^o (d) 75^o

33. The line passing through the points $(3,-4)$ and $(-2,6)$ and a line passing through $(-3,6)$ and $(9,-18)$, are

(a) Perpendicular (b) Parallel

(c) Makes an angle 60^o with each other (d) None of these

34. Equation of the two straight lines passing through the point (3, 2) and making an angle of 45^o with the line $x-2y=3$, are

(a) $3x+y+7=0$ and $x+3y+9=0$ (b) $3x-y-7=0$ and $x+3y-9=0$

(c) $x+3y-7=0$ and $x+3y-9=0$ (d) None of these

35. The diagonals of the parallelogram whose sides are $lx+my+n=0,\ lx+my+n'=0,\ mx+ly+n=0,\ mx+ly+n'=0$ include an angle

(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{2}$ (c) $\tan^{-1}\left(\frac{l^2-m^2}{l^2+m^2}\right)$ (d) $\tan^{-1}\left(\frac{2lm}{l^2+m^2}\right)$

36. The sides AB, BC, CD and DA of a quadrilateral are $x+2y=3, x=1, x-3y=4, 5x+y+12=0$ respectively. The angle between diagonals AC and BD is

(a) 45^o (b) 60^o (c) 90^o (d) 30^o

37. One diagonal of a square is along the line $8x-15y=0$ and one of its vertex is (1, 2). Then the equation of the sides of the square passing through this vertex, are

(a) $23x+7y=9,\ 7x+23y=53$ (b) $23x-7y+9=0,\ 7x+23y+53=0$

(c) $23x-7y-9=0,\ 7x+23y-53=0$ (d) None of these

38. The parallelism condition for two straight lines one of which is specified by the equation $ax+by+c=0$ the other being represented parametrically by $x=\alpha t+\beta,\ y=\gamma t+\delta$ is given by

(a) $a\gamma-b\alpha=0, \beta=\delta=c=0$ (b) $a\alpha-b\gamma=0, \beta=\delta=0$ (c) $a\alpha+b\gamma=0$ (d) $a\gamma=b\alpha=0$

39. If straight lines $ax+by+p=0$ and $x\cos\alpha+y\sin\alpha-p=0$ include an angle $\frac{\pi}{4}$ between them and meet the straight line $x\sin\alpha-y\cos\alpha=0$ in the same point, then the value of a^2+b^2 is equal to

(a) 1 (b) 2 (c) 3 (d) 4

40. The ends of the base of an isosceles triangle are at (2*a*, 0) and $(0, a)$. The equation of one side is $x=2a$. The equation of the other side is

(a) $x+2y-a=0$ (b) $x+2y=2a$ (c) $3x+4y-4a=0$ (d) $3x-4y+4a=0$

41. If *a,b,c* are in harmonic progression, then straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through a fixed point, that point is

(a) $(-1,-2)$ (b) $(-1,2)$ (c) $(1,-2)$ (d) $(1,-1/2)$

42. Angles made with the x-axis by two lines drawn through the point (1, 2) and cutting the line $x+y=4$ at a distance $\frac{1}{3}\sqrt{6}$ from the point (1, 2) are

(a) $\frac{\pi}{6}$ and $\frac{\pi}{3}$ (b) $\frac{\pi}{8}$ and $\frac{3\pi}{8}$ (c) $\frac{\pi}{12}$ and $\frac{5\pi}{12}$ (d) None of these

43. The equations of two equal sides of an isosceles triangle are $7x-y+3=0$ and $x+y-3=0$ and the third side passes through the point (1, –10). The equation of the third side is

(a) $x-3y-31=0$ but not $3x+y+7=0$ (b) $3x+y+7=0$ but not $x-3y-31=0$

(c) $3x+y+7=0$ or $x-3y-31=0$ (d) Neither $3x+y+7=0$ nor $x-3y-31=0$

44. Given vertices $A(1,1);\ B(4,-2)$ and $C(5,5)$ of a triangle, then the equation of the perpendicular dropped from *C* to the interior bisector of the angle *A* is

(a) $y-5=0$ (b) $x-5=0$ (c) $y+5=0$ (d) $x+5=0$

45. The equation of bisectors of the angles between the lines $|x|=|y|$ are

(a) $y=\pm x$ and $x=0$ (b) $x=\frac{1}{2}$ and $y=\frac{1}{2}$ (c) $y=0$ and $x=0$ (d) None of these

46. A point moves so that square of its distance from the point (3, –2) is numerically equal to its distance from the line $5x-12y=13$. The equation of the locus of the point is

(a) $13x^2+13y^2-83x+64y+182=0$ (b) $x^2+y^2-11x+16y+26=0$

(c) $x^2+y^2-11x+16y=0$ (d) None of these

47. The points on the line $x+y=4$ which lie at a unit distance from the line $4x+3y=10$, are

(a) $(3,1),(-7,11)$ (b) $(3,1),(7,11)$ (c) $(-3,1),(-7,11)$ (d) $(1,3),(-7,11)$

48. A variable line passes through a fixed point *P*. The algebraic sum of the perpendiculars drawn from (2, 0),(0, 2) and (1, 1) on the line is zero, then the coordinates of the *P* are

(a) (1, –1) (b) (1, 1) (c) (2, 1) (d) (2, 2)

49. A line *L* passes through the points (1, 1) and (2, 0) and another line *L′* passes through $\left(\frac{1}{2},0\right)$ and perpendicular to *L*. Then the area of the triangle formed by the lines *L*, *L*' and *y*-axis, is

(a) $\frac{15}{8}$ (b) $\frac{25}{4}$ (c) $\frac{25}{8}$ (d) $\frac{25}{16}$

50. Equation of a straight line on which length of perpendicular from the origin is four units and the line makes an angle of 120^{o} with the *x*-axis, is

(a) $x\sqrt{3}+y+8=0$ (b) $x\sqrt{3}-y=8$ (c) $x\sqrt{3}-y=8$ (d) $x-\sqrt{3}y+8=0$