EXERCISE-I

Slope of line, Equations of line in different forms

1. The equation of the line whose slope is 3 and which cuts off an intercept 3 from the positive x – axis is

(A) $y = 3x - 9$ (B) $y = 3x + 3$

(C) $y = 3x + 9$ (D) None of these

2. If the coordinates of the points *A, B, C, D,* be (a, b), (a', b'), $(-a, b)$ and $(a', -b')$ respectively, then the equation of the line bisecting the line segments *AB* and *CD* is

(A) $2a'y - 2bx = ab - a'b'$

(B) $2ay - 2b'x = ab - a'b'$

(C) $2ay - 2b'x = a'b - ab'$

(D) None of these

3. The equation of the straight line passing through the point (3, 2) and perpendicular to the line $y = x$ is

(A) $x - y = 5$ (B) $x + y = 5$

(C) $x + y = 1$ (D) $x - y = 1$

4. If the coordinates of *A* and *B* be (1, 1) and (5, 7), then the equation of the perpendicular bisector of the line segment *AB* is

(A) $2x + 3y = 18$ (B) $2x - 3y + 18 = 0$

(C) $2x + 3y - 1 = 0$ (D) $3x - 2y + 1 = 0$

5. If the coordinates of the points *A, B, C* be (– 1, 5), (0, 0) and (2, 2) respectively and *D* be the middle point of *BC,* then the equation of the perpendicular drawn from *B* to the line *AD* is

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

(C) $x - 2y = 0$ (D) $2x - y = 0$

6. The equation of the line passing through the point (x', y') and perpendicular to the line $yy' = 2a(x + x')$ is

(A) $xy' + 2ay + 2ay' - x'y' = 0$

(B) $xy' + 2ay - 2ay' - x'y' = 0$

(C) $xy' + 2ay + 2ay' + x'y' = 0$

(D) $xy' + 2ay - 2ay' + x'y' = 0$

7. 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

8. If the coordinates of the vertices of the triangle ABC be (–1, 6), (–3, –9), and (5, –8) respectively, then the equation of the median through *C* is

(A) $13x - 14y - 47 = 0$

(B) $13x - 14y + 47 = 0$

(C) $13x + 14y + 47 = 0$

(D) $13x + 14y - 47 = 0$

9. The equation of the line perpendicular to the line $\frac{x}{a} - \frac{y}{b} = 1$ and passing through the point at which it cuts x–axis, is

(A) $\frac{x}{a} + \frac{y}{b} + \frac{a}{b} = 0$ (B) $\frac{x}{b} + \frac{y}{a} = \frac{b}{a}$

(C) $\frac{x}{b} + \frac{y}{a} = 0$ (D) $\frac{x}{b} + \frac{y}{a} = \frac{a}{b}$

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

(A) $y - x + 1 = 0$ (B) $y - x - 1 = 0$

(C) $y - x + 2 = 0$ (D) $y - x - 2 = 0$

11. The equation of a line through the intersection of lines $x = 0$ and $y = 0$ and through the point (2, 2), is

(A) $y = x - 1$ (B) $y = -x$

(C) $y = x$ (D) $y = -x + 2$

12. Equation of a line through the origin and perpendicular to, the line joining (*a,* 0) and (– *a,* 0), is

(A) $y = 0$ (B) $x = 0$

(C) $x = -a$ (D) $y = -a$

13. For specifying a straight line how many geometrical parameters should be known

(A) 1 (B) 2

(C) 4 (D) 3

14. 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) $2x + y + 7 = 0$

15. 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) $2x - y + 4 = 0$

16. 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

17. 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

18. The equation of line passing through (*c, d*) and parallel to $ax + by + c = 0$, is

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

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

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

(D) None of these

19. The equation of line passing through point of intersection of lines $3x - 2y - 1 = 0$ and $x - 4y + 3 = 0$ and the point $(\pi, 0)$, is

(A) $x - y = \pi$ (B) $x - y = \pi(y + 1)$

(C) $x - y = \pi(1 - y)$ (D) $x + y = \pi(1 - y)$

20. A line perpendicular to the line $ax + by + c = 0$ and passes through (a, b). The equation of the line is

(A) $bx - ay + (a^2 - b^2) = 0$

(B) $bx - ay - (a^2 - b^2) = 0$

(C) $bx - ay = 0$

(D) None of these

21. The equation of the line which cuts off the intercepts $2a\sec\theta$ and $2a\,\mathrm{cosec}\,\theta$ on the axes is

(A) $x\sin\theta + y\cos\theta - 2a = 0$

(B) $x\cos\theta + y\sin\theta - 2a = 0$

(C) $x\sec\theta + y\,\mathrm{cosec}\theta - 2a = 0$

(D) $x\,\mathrm{cosec}\theta + y\sec\theta - 2a = 0$

22. If the equation $y = mx + c$ and $x\cos\alpha + y\sin\alpha = p$ represents the same straight line, then

(A) $p = c\sqrt{1 + m^2}$ (B) $c = p\sqrt{1 + m^2}$

(C) $cp = \sqrt{1 + m^2}$ (D) $p^2 + c^2 + m^2 = 1$

23. The equation to the straight line passing through the point of intersection of the lines $5x - 6y - 1 = 0$ and $3x + 2y + 5 = 0$ and perpendicular to the line $3x - 5y + 11 = 0$ is

(A) $5x + 3y + 8 = 0$ (B) $3x - 5y + 8 = 0$

(C) $5x + 3y + 11 = 0$ (D) $3x - 5y + 11 = 0$

24. Line passing through (1, 2) and (2, 5) is

(A) $3x - y + 1 = 0$ (B) $3x + y + 1 = 0$

(C) $y - 3x + 1 = 0$ (D) $3x + y - 1 = 0$

25. Equation of line passing through (1, 2) and perpendicular to $3x + 4y + 5 = 0$ is

(A) $3y = 4x - 2$ (B) $3y = 4x + 3$

(C) $3y = 4x + 4$ (D) $3y = 4x + 2$

26. The number of lines that are parallel to $2x + 6y + 7 = 0$ and have an intercept of length 10 between the coordinate axes is

(A) 1 (B) 2

(C) 4 (D) Infinitely many

27. A line passes through (2, 2) and is perpendicular to the line $3x + y = 3$. Its *y*–intercept is

(A) $1/3$ (B) $2/3$

(C) 1 (D) $4/3$

28. A straight the makes an angle of 135° with the *x*–axis and cuts *y*–axis at a distance – 5 from the origin. The equation of the line is

(A) $2x + y + 5 = 0$ (B) $x + 2y + 3 = 0$

(C) $x + y + 5 = 0$ (D) $x + y + 3 = 0$

29. A straight line through *P*(1, 2) is such that its intercept between the axes is bisected at *P*. Its equation is

(A) $x + 2y = 5$ (B) $x - y + 1 = 0$

(C) $x + y - 3 = 0$ (D) $2x + y - 4 = 0$

30. The equation of the straight line joining the point (a, b) to the point of intersection of the lines $\frac{x}{a} + \frac{y}{b} = 1$ and $\frac{x}{b} + \frac{y}{a} = 1$ is

(A) $a^2y - b^2x = ab\,(a - b)$

(B) $a^2y + b^2y = ab\,(a + b)$

(C) $a^2y + b^2x = ab$

(D) $a^2x + b^2y = ab\,(a - b)$

31. Equation of a line passing through (1, –2) and perpendicular to the line $3x - 5y + 7 = 0$ is

(A) $5x + 3y + 1 = 0$ (B) $3x + 5y + 1 = 0$

(C) $5x - 3y - 1 = 0$ (D) $3x - 5y + 1 = 0$

32. If the line $\frac{x}{a} + \frac{y}{b} = 1$ passes through the points (2, – 3) and (4, – 5), then $(a, b) =$

(A) (1, 1) (B) (– 1, 1)

(C) (1, – 1) (D) (– 1, – 1)

33. 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)

34. For the lines $2x + 5y = 7$ and $2x - 5y = 9$, which of the following statement is true

(A) Lines are parallel

(B) Lines are coincident

(C) Lines are intersecting

(D) Lines are perpendicular

35. The opposite angular points of a square are $(3, 4)$ and $(1, -1)$. Then the co-ordinates of other two points are

(A) $D\left(\frac{1}{2}, \frac{9}{2}\right), B\left(-\frac{1}{2}, \frac{5}{2}\right)$

(B) $D\left(\frac{1}{2}, \frac{9}{2}\right), B\left(\frac{1}{2}, \frac{5}{2}\right)$

(C) $D\left(\frac{9}{2}, \frac{1}{2}\right), B\left(-\frac{1}{2}, \frac{5}{2}\right)$

(D) None of these

36. Two consecutive sides of a parallelogram are $4x + 5y = 0$ and $7x + 2y = 0$. If the equation to one diagonal is $11x + 7y = 9$, then the equation of the other diagonal is

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

(C) $x - y = 0$ (D) None of these

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 opposite vertices of a square are (1, 2) and (3, 8), then the equation of a diagonal of the square passing through the point (1, 2), is

(A) $3x - y - 1 = 0$ (B) $3y - x - 1 = 0$

(C) $3x + y + 1 = 0$ (D) None of these

39. The ends of the base of an isosceles triangle are at $(2a, 0)$ 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) $3x - 4y + 4a = 0$

40. The equation of the lines on which the perpendiculars from the origin make 30^o angle with *x*–axis and which form a triangle of area $\frac{50}{\sqrt{3}}$ with axes, are

(A) $x + \sqrt{3}y \pm 10 = 0$ (B) $\sqrt{3}x + y \pm 10 = 0$

(C) $x \pm \sqrt{3}y - 10 = 0$ (D) None of these

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. If the straight line $ax + by + c = 0$ always passes through (1, – 2), then *a, b, c* are

(A) In A.P. (B) In H.P.

(C) In G.P. (D) None of these

43. If $u = a_1x + b_1y + c_1 = 0$,
$v = a_2x + b_2y + c_2 = 0$ and $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, then the curve $u + kv = 0$ is

(A) The same straight line *u*

(B) Different straight line

(C) It is not a straight line

(D) None of these

44. For what values of *a* and *b* the intercepts cut off on the coordinate axes by the line $ax + by + 8 = 0$ are equal in length but opposite in signs to those cut off by the line $2x - 3y + 6 = 0$ on the axes

(A) $a = \frac{8}{3}, b = -4$ (B) $a = -\frac{8}{3}, b = -4$

(C) $a = \frac{8}{3}, b = 4$ (D) $a = -\frac{8}{3}, b = 4$

45. If *a* and *b* are two arbitrary constants, then the straight line
$(a - 2b)x + (a + 3b)y + 3a + 4b = 0$
will pass through

(A) $(-1, -2)$ (B) (1, 2)

(C) $(-2, -3)$ (D) (2, 3)

46. Equation of the straight line making equal intercepts on the axes and passing through the point (2, 4) is

(A) $4x - y - 4 = 0$ (B) $2x + y - 8 = 0$

(C) $x + y - 6 = 0$ (D) $x + 2y - 10 = 0$

47. The equation of the straight line passing through the point (4, 3) and making intercepts on the co-ordinate axes whose sum is – 1 is

(A) $\frac{x}{2} - \frac{y}{3} = 1$ and $\frac{x}{-2} + \frac{y}{1} = 1$

(B) $\frac{x}{2} - \frac{y}{3} = -1$ and $\frac{x}{-2} + \frac{y}{1} = -1$

(C) $\frac{x}{2} - \frac{y}{3} = 1$ and $\frac{x}{2} + \frac{y}{1} = 1$

(D) $\frac{x}{2} + \frac{y}{3} = -1$ and $\frac{x}{-2} + \frac{y}{1} = -1$

48. The line which is parallel to x–axis and crosses the curve $y=\sqrt{x}$ at an angle of 45° is equal to

(A) $x=\frac{1}{4}$ (B) $y=\frac{1}{4}$

(C) $y=\frac{1}{2}$ (D) $y=1$

49. The equation of the line perpendicular to line $ax+by+c=0$ and passing through (a, b) is equal to

(A) $bx-ay=0$

(B) $bx+ay-2ab=0$

(C) $bx+ay=0$

(D) None of these

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

(A) 4 (B) – 4

(C) 2 (D) – 2

Angle between two straight lines, Bisector of angle between two lines

51. To which of the following types the straight lines represented by $2x+3y-7=0$ and $2x+3y-5=0$ belong

(A) Parallel to each other

(B) Perpendicular to each other

(C) Inclined at 45° to each other

(D) Coincident pair of straight lines

52. The obtuse angle between the lines $y=-2$ and $y=x+2$ is

(A) 120° (B) 135°

(C) 150° (D) 160°

53. The line passes through (1, 0) and $(-2, \sqrt{3})$ makes an angle of ...... with x–axis

(A) 60° (B) 120°

(C) 150° (D) 135°

54. Angle between $x=2$ and $x-3y=6$ is

(A) ∞ (B) $\tan^{-1}(3)$

(C) $\tan^{-1}\left(\frac{1}{3}\right)$ (D) None of these

55. If the lines $y=(2+\sqrt{3})x+4$ and $y=kx+6$ are inclined at an angle 60° to each other, then the value of k will be

(A) 1 (B) 2

(C) – 1 (D) – 2

56. A straight line $(\sqrt{3}-1)x=(\sqrt{3}+1)y$ makes an angle 75° with another straight line which passes through origin. Then the equation of the line is

(A) $x=0$ (B) $y=0$

(C) $x+y=0$ (D) $x-y=0$

57. The angle between the lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0,$ is

(A) $\tan^{-1}\frac{a_1b_2+a_2b_1}{a_1a_2-b_1b_2}$

(B) $\cot^{-1}\frac{a_1a_2+b_1b_2}{a_1b_2-a_2b_1}$

(C) $\cot^{-1}\frac{a_1b_1-a_2b_2}{a_1a_2+b_1b_2}$

(D) $\tan^{-1}\frac{a_1b_1-a_2b_2}{a_1a_2+b_1b_2}$

58. The inclination of the straight line passing through the point (–3, 6) and the midpoint of the line joining the point (4, –5) and (–2, 9) is

(A) $\pi/4$ (B) $\pi/6$

(C) $\pi/3$ (D) $3\pi/4$

59. The angle between the lines $2x-y+3=0$ and $x+2y+3=0$ is

(A) 90° (B) 60°

(C) 45° (D) 30°

60. The angle between the straight lines $x - y\sqrt{3} = 5$ and $\sqrt{3x} + y = 7$ is

(A) 90^{o} (B) 60^{o}

(C) 75^{o} (D) 30^{o}

61. The lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are perpendicular to each other, if

(A) $a_1b_2 - b_1a_2 = 0$ (B) $a_1a_2 + b_1b_2 = 0$

(C) $a_1^2b_2 + b_1^2a_2 = 0$ (D) $a_1b_1 + a_2b_2 = 0$

62. The lines $y = 2x$ and $x = -2y$ are

(A) Parallel

(B) Perpendicular

(C) Equally inclined to axes

(D) Coincident

63. If the line passing through (4, 3) and (2, *k*) is perpendicular to $y = 2x + 3$, then $k =$

(A) –1 (B) 1

(C) – 4 (D) 4

64. The number of straight lines which is equally inclined to both the axes is

(A) 4 (B) 2

(C) 3 (D) 1

65. The equation of the bisector of the acute angle between the lines $3x - 4y + 7 = 0$ and $12x + 5y - 2 = 0$ is

(A) $21x + 77y - 101 = 0$

(B) $11x - 3y + 9 = 0$

(C) $31x + 77y + 101 = 0$

(D) $11x - 3y - 9 = 0$