Multiple Choice Questions

[MHT-CET 2022]
(online shift)
(Memory Based Questions)

1. The equations of the line passing through the point (3, 2) and making an acute angle of 45° with the line $x - 2y - 3 = 0$ are

   a) $3x + y - 11 = 0 ; x + 3y + 9 = 0$
   b) $3x + y - 11 = 0 ; x + 3y - 9 = 0$
   c) $3x - y - 7 = 0 ; x + 3y - 9 = 0$
   d) $x + 2y - 7 = 0 ; 2x - y - 4 = 0$

2. The co-ordinates of the foot of the perpendicular from the point (1, 2) on the line $x - 3y + 7 = 0$ are

   a) $\left(\frac{-13}{5}, \frac{-2}{5}\right)$
   b) $\left(\frac{4}{5}, \frac{13}{5}\right)$
   c) (2, 3)
   d) $(-13, -2)$

3. The slopes of the lines, making angles of measure 45° with the line $2x - 3y = 5$ are

   a) $-\frac{1}{5}, -5$
   b) $5, \frac{1}{5}$
   c) $5, -\frac{1}{5}$
   d) $\frac{1}{5}, -5$

4. Let a, b, c and d be non-zero real numbers. If the point of intersection of the lines $4ax + 2ay + c = 0$ and $5bx + 2by + d = 0$ lies in 4th quadrant and is equidistant from the two axes, then

   a) $2bc - 3ad = 0$
   b) $2ad - 3bc = 0$
   c) $2bc + 3ad = 0$
   d) $3bc + 2ad = 0$

5. The combined equation of the lines whose inclinations are $\frac{\pi}{6}$ and $\frac{5\pi}{6}$ and passing through origin is

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

6. The set of all possible values of θ in the interval $(0, \pi)$ for which the points (1, 2) and (sin θ, cos θ) lie on the same side of the line $x + y = 1$ is

   a) $\left(0, \frac{3\pi}{4}\right)$
   b) $\left(0, \frac{\pi}{4}\right)$
   c) $\left(0, \frac{\pi}{2}\right)$
   d) $\left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$

7. The equation of a line, whose perpendicular distance from the origin is 5 units and the angle, which the perpendicular to the line from the origin makes, is 210° with positive x – axis is

   a) $x\sqrt{3} + y - 10 = 0$
   b) $-x\sqrt{3} + y + 10 = 0$
   c) $x\sqrt{3} - y + 10 = 0$
   d) $x\sqrt{3} + y + 10 = 0$

8. The equation of the perpendicular to $2x - 3y + 5 = 0$ and making an intercept 3 with positive Y – axis is

   a) $3x + 2y - 6 = 0$
   b) $3x + 2y - 12 = 0$
   c) $3x + 2y - 7 = 0$
   d) $3x + 2y + 6 = 0$

9. If the straight lines $\frac{x-1}{2}=\frac{y+1}{k}=\frac{z}{2}$ and $\frac{x+1}{5}=\frac{y+1}{2}=\frac{z}{k}$ are coplanar, then the plane (s) containing these two lines is/are

a) $y+2z=-1$ b) $y+z=-1$ c) $y-z=-1$ d) $y-2z=-1$

10. The lines $x+2y-5=0$, $2x-3y+4=0$, $6x+4y-13=0$

a) are concurrent b) form a right - angled triangle

c) form an isosceles triangle d) form an equilateral triangle

[MHT-CET 2021]

(online shift)

(Memory Based Questions)

11. The slope of the line through the origin which makes an angle of 30° with the positive direction of Y – axis measured anticlockwise is

a) $\frac{-2}{\sqrt{3}}$ b) $-\sqrt{3}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{-1}{\sqrt{3}}$

12. The x – intercept of a line passing through the points $\left(\frac{-1}{2}, 1\right)$ and (1 , 2) is

a) – 1 b) – 2 c) 1 d) 3

13. If P is the length of the perpendicular from origin to the line whose intercepts on the axes are 'a' and 'b', then $\frac{1}{a^2}+\frac{1}{b^2}=$ .....

a) P^2 b) $\frac{1}{2P^2}$ c) $2P^2$ d) $\frac{1}{P^2}$

14. If the line joining two points A (2, 0) and B (3, 1) is rotated about A in anticlockwise direction through an angle 15°, then the equation of the line in new position is

a) $y=3x-6$ b) $y=\sqrt{3}\,x-2\sqrt{3}$ c) $y=-\sqrt{3}\,x+2\sqrt{3}$ d) $y=\frac{1}{\sqrt{3}}x-\frac{2}{\sqrt{3}}$

15. The combined equation of a pair of lines passing through the origin and inclined at 60° and 30° respectively with x – axis is

a) $\sqrt{3}\,(x^2+y^2)=2xy$ b) $\sqrt{3}\,(x^2+y^2)=4xy$

c) $4\,(x^2+y^2)=\sqrt{3}\,xy$ d) $2\,(x^2+y^2)=\sqrt{3}\,xy$

16. The polar co-ordinates of a point are $\left(2, \frac{\pi^c}{4}\right)$. Then its cartesian co-ordinates are

a) $(\sqrt{2}, \sqrt{2})$ b) (2, 2) c) $(2, \sqrt{2})$ d) $(\sqrt{2}, 2)$

17. The equation of a line with slope $\frac{1}{\sqrt{2}}$ and making an intercept $2\sqrt{2}$ units on negative direction of y – axis is

a) $\sqrt{2}y - x + 4 = 0$ b) $x + \sqrt{2}y + 2\sqrt{2} = 0$

c) $\sqrt{2}y + x + 4 = 0$ d) $x + \sqrt{2}y - 2\sqrt{2} = 0$

18. The three straight lines $ax + by = c$, $bx + cy = a$ and $cx + ay = b$ are collinear if

a) $b + c = a$ b) $c + a = b$ c) $a + b + c = 0$ d) $a + b = c$

19. A line has slope m and y – intercept 4. The distance between the origin and the line is equal to

a) $\frac{4}{\sqrt{1-m^2}}$ b) $\frac{4}{\sqrt{m^2-1}}$ c) $\frac{4}{\sqrt{m^2+1}}$ d) $\frac{4m}{\sqrt{1+m^2}}$

20. A line passes through the point of intersection of the lines $3x + y + 1 = 0$ and $2x - y + 3 = 0$ and makes equal intercepts with axes, then equation of the line is

a) $5x + 5y - 3 = 0$ b) $x + 5y - 3 = 0$ c) $5x - y - 3 = 0$ d) $5x + 5y + 3 = 0$

[MHT-CET 2020]

(online shift)

(Memory Based Questions)

21. The line through the points (1, 4), (–5, 1) intersects the line $4x + 3y - 5 = 0$ in the point

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

22. If the length of perpendicular drawn from the point (4, 1) on the line $3x - 4y + k = 0$ is 2 units then the values of k are

a) – 2, 18 b) – 2, – 18 c) – 2, 1 d) 2, – 18

23. The equation of the line passing through the point (7, –4) and perpendicular to the line passing through the points (2, 3) and (1, –2) is

a) $x - 2y - 15 = 0$ b) $x + 2y + 1 = 0$ c) $x - 5y - 13 = 0$ d) $x + 5y + 13 = 0$

24. If P_1 and P_2 are the lengths of perpendiculars from the origin to the lines $x \sin\theta + y \cos\theta = 5 \cos 2\theta$ and $x \operatorname{cosec}\theta + y \sec\theta - 5 = 0$ respectively, then $P_1^2 + 4P_2^2 =$ .....

a) 25 b) 5 c) $\frac{1}{5}$ d) $\frac{1}{25}$

25. The cartesian co-ordinates of the point whose polar co-ordinates are $\left(\frac{1}{2}, 120°\right)$ are

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

26. The equations of the line which makes intercepts on the axes whose sum is 8 and product is 15 are

a) $3x - 5y + 15 = 0 ; 5x + 3y + 15 = 0$ b) $3x + 5y - 15 = 0 ; 3y + 5x - 15 = 0$

c) $3x + 5y + 15 = 0 ; 5x + 3y - 15 = 0$ d) $5x - 3y + 15 = 0 ; 3x + 5y + 15 = 0$

27. A line cuts x and y axes at the points A and B resp. The point (5, 6) divides the line segment AB internally in the ratio 3 : 1, then the equation of line is

a) $2x - 2y = 20$ b) $2x + y = 16$ c) $2x - y = 4$ d) $2x + 5y = 40$

28. The length of the perpendicular from the point P(a, b) to the line $\frac{x}{a} + \frac{y}{b} = 1$ is

a) $\left|\frac{ab}{\sqrt{a^2+b^2}}\right|$ units b) $\left|\frac{b^2}{\sqrt{a^2+b^2}}\right|$ units

c) $\left|\frac{\sqrt{a^2+b^2}}{ab}\right|$ units d) $\left|\frac{a^2}{\sqrt{a^2+b^2}}\right|$ units

29. ABCD is parallelogram, P is the midpoint of AB. If R is the point of intersection of AC and DP, then R divides AC internally in the ratio

a) 2 : 1 b) 2 : 3 c) 1 : 2 d) 3 : 1

30. If $(a, -2a)$, $a > 0$ is the midpoint of a line segment intercepted between the co-ordinate axes, then the equation of line is

a) $2x - y = 4a$ b) $x - 2y = 5a$ c) $2x - y + 4a = 0$ d) $x - 2y + 4a = 0$

31. The points A $(-a, -b)$, B (0, 0), C (a, b) and D (a^2, ab) are

a) vertices of rectangle c) vertices of parallelogram

c) vertices of square d) collinear

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32. If a and b are the intercepts made by a line on the coordinate axes such that $3a = b$ and the line passes through (1, 3), then the equation of the line is]

a) $x - 3y + 8 = 0$ b) $x + 3y - 10 = 0$ c) $3x + y - 6 = 0$ d) $3x + y - 3 = 0$

33. The perpendicular drawn from the origin to the line has length 8 and the perpendicular makes angle of 120° with the positive direction of x-axis. Then the equation of the line is

a) $x - \sqrt{3}y + 16 = 0$ b) $x - \sqrt{3}y - 16 = 0$ c) $x + \sqrt{3}y + 16 = 0$ d) $x + \sqrt{3}y - 16 = 0$

34. The straight lines l_1 and l_2 passes through the origin and trisect the line segment of the line l : $9x + 5y = 45$ between the axes. If m_1 and m_2 are the slopes of the lines l_1 and l_2, then the point of intersection of the line $y = (m_1 + m_2)x$ with l lies on

a) $y - 2x = 5$ b) $6x + y = 10$ c) $y - x = 5$ d) $6x - y = 15$

35. If k_i are possible values of k for which lines $kx + 2y + 2 = 0$, $2x + ky + 3 = 0$ and $3x + 3y + k = 0$ are concurrent, then $\Sigma k_i =$

a) -2 b) 0 c) 2 d) 5