

THREE DIMENSIONAL GEOMETRY

ANGLE BETWEEN A LINE AND A PLANE

EXERCISE

(FOR COMPETITIVE EXAM)

Q.1 Determine the value of k for the given plane $x + 2y + kz + 2 = 0$ and the directional ratios of a line $(8, 3, 2)$ if they are parallel to each other.

- (A) 21 (B) -17 (C) 12 (D) -7

Q.2 The plane $5x + y + kz + 1 = 0$ and the directional ratios of a line $(3, -1, 1)$ are parallel. Determine the value of k .

- (A) 4 (B) -14 (C) 6 (D) -8

Q.3 Determine the angle between the plane $2x + 3y - 2z + 4 = 0$ and the vector $(2, 1, 1)$.

- (A) 38.2 (B) 19.64 (C) 89.21 (D) 29.34

Q.4 What is the equation of the plane represented in the formula?

$$\sin \theta = \frac{a_1a + b_1b + c_1c}{\sqrt{a^2 + b^2 + c^2} \sqrt{a_1^2 + b_1^2 + c_1^2}} ?$$

- (A) $a_1x - b_1y + c_1z + d_1 = 0$
 (B) $a_1x^2 + b_1y^2 + c_1z^2 + d_1 = 0$
 (C) $ax + by + cz + d = 0$
 (D) $a_1x + b_1y + c_1z + d_1 = 0$ and $ax + by + cz + d = 0$

Q.5 What is the connection between the plane equation $ax + by + cz + d = 0$ and the direction ratios a_1, b_1, c_1 of a line, when the plane and the line are perpendicular to each other?

- (A) $\frac{a_1}{b_1} = \frac{a_2}{c_1} = \frac{c_2}{b_2}$ (B) $\frac{a_1}{a_2} = \frac{b_1}{c_2} = \frac{c_1}{b_2}$
 (C) $\frac{a}{a_1} = \frac{b}{b_1} = \frac{c}{c_1}$ (D) $\frac{c_1}{a_2} = \frac{b_1}{b_2} = \frac{a_1}{c_2}$

ANSWER KEY

1. (D) $K = -7$
2. (B) $K = -14$
3. (D) $\theta = 29.34$
4. (C) $ax + by + cz + d = 0$
5. (C) $\frac{a}{a_1} = \frac{b}{b_1} = \frac{c}{c_1}$