THREE DIMENSIONAL GEOMETRY

COPLANARITY OF TWO LINE

EXERCISE

Q.1 Which of the following is used to represent in Cartesian form?

(A) Function (B) Equation (C) Coordinates (D) Vector

Q.2 Represent the vector $A = 5\hat{i} + 2\hat{j} + 3\hat{k}$ in Cartesian form.

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

(C) $-\vec{A} = -5\hat{i} - 2\hat{j} - 3\hat{k}$ (D) $f(x) = 5x + 2y + 3$

Q.3 The Cartesian equation of a line is $\frac{x-2}{5} = \frac{y-1}{7} = \frac{z-4}{9}$.

(A) $\vec{r} = 2\hat{i} + \hat{j} + 4\hat{k} + \lambda(5\hat{i} + 7\hat{j} + 9\hat{k})$ (B) $\vec{r} = 5\hat{i} + 7\hat{j} + 9\hat{k} + \lambda(2\hat{i} + \hat{j} + 4\hat{k})$

(C) $\vec{r} = -2\hat{i} - \hat{j} - 4\hat{k} + \lambda(5\hat{i} + 7\hat{j} + 9\hat{k})$ (D) $\vec{r} = \lambda(5\hat{i} + 7\hat{j} + 9\hat{k})$

Q.4 Write the equation of the line passing through the points (3, 4, 2), and (5, -2, 4), in Cartesian form..

Q.5 Find the equation of a plane into Cartesian form, which is passing through the point (2, 3, 4), and is perpendicular to the line having direction ratios as 5, -3, 2.

Q.6 Show that lines $\frac{x+3}{-3} = \frac{y-1}{1} = \frac{z-5}{5}$ and $\frac{x+1}{-1} = \frac{y-2}{2} = \frac{z-5}{5}$ are coplanar.

ANSWER KEY

1. (C) Coordinates

2. (B) (5,2,3)

3. (A) $\vec{r} = 2\hat{i} + \hat{j} + 4\hat{k} + \lambda(5\hat{i} + 7\hat{j} + 9\hat{k})$

4. Therefore, the equation of the line in Cartesian form is

$$\frac{x-3}{2} = \frac{y-4}{-6} = \frac{z-2}{2}$$

5. Therefore, the equation of the plane in Cartesian form is $5x - 3y + 2z = 9$.