BRAIN INTERNATIONAL SCHOOL

SUBJECT : MATHEMATICS CLASS : XII NOV 2024

CHAPTER : THREE DIMENSIONAL GEOMETRY

Q1. Find the coordinates of the point where the line joining the point $A(3,4,1)$ and $B(5,1,6)$ crosses the XY-plane.

Q2. If direction cosines of a line are $\frac{1}{a}, \frac{1}{a}, \frac{1}{a}$, find the value of a.

Q3. Find the foot of the perpendicular drawn from the point $A(1,0,3)$ to the join of the points $B(4,7,1)$ and $C(3,5,3)$.

Q4. Find whether or not the two given lines intersect : $\vec{r} = (\hat{\imath} - 2\hat{\jmath} + 3\hat{k}) + \lambda(-\hat{\imath} + \hat{\jmath} - 2\hat{k})$ and $\vec{r} = (\hat{\imath} - \hat{\jmath} - \hat{k}) + \lambda(\hat{\imath} + 2\hat{\jmath} - 2\hat{k})$.

Q5. Find the equation of the lines of shortest distance between the lines, $\frac{x-8}{3} = \frac{y+9}{-16} = \frac{z-10}{7}$ and $\frac{x-15}{3} = \frac{y-29}{8} = \frac{5-z}{5}$. Also find the shortest distance between the lines.

Q6. Find the equation of the line through the point $(3,\ 0,\ 1)$ and parallel to the planes $x + 2y = 0$ and $3y - z = 0$.

Q7. If a line makes angles $90^0, 60^0$ and θ with x, y and z-axis respectively, where θ is acute, then find θ.

Q8. Find the direction cosines of the line $\frac{4-x}{2} = \frac{y}{6} = \frac{1-z}{3}$.

Q9. Find the Cartesian equation of the line which passes through the point $(-2,4,-5)$ and is parallel to the line $\frac{x+3}{3} = \frac{4-y}{5} = \frac{z+8}{6}$.

Q10. If the equation of a line AB is $\frac{3-x}{-3} = \frac{y+2}{-2} = \frac{z+2}{6}$, find the direction cosines of a line parallel to AB.

Q11. Write the vector equations of the following lines and hence determine the distance between them $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z+4}{6}$ and $\frac{x-3}{4} = \frac{y-3}{6} = \frac{z+5}{12}$.