THREE DIMENSIONAL CO-ORDINATE GEOMETRY

1.Find the equation of the plane through the points (1,1,0), (1,6,5) and perpendicular to

plane 5x + 3y -17z = 0.

2. Find the shortest distance between the lines $\vec{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k}$ and

$\vec{r} = (s+1)\hat{i} + (2s-1)\hat{j} - (2s+1)\hat{k}$.

3. Find the shortest distance between the lines $\frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1}$ and

$\frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}$.

4.Find the equation of the plane through the intersection of the planes x + y + z = 1 and

2x + 3y + 4z =5 which is perpendicular to the plane x – y + z = 0 .

5. Find the equation of the plane that contains the point (1,-1,2) and is perpendicular each of the planes 2x + 3y – 2z = 5 and x + 2y – 3z = 8.

6. Find the distance of the point (1,-1, 2) and is perpendicular to each of the planes 2x + 3y – 2z = 5 and x + 2y – 3z = 8 .

7. Prove that the equation of the plane making intercepts a, b, c on the co-ordinate axes ,is

of the form $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$.

8. A variable plane moves so that sum of reciprocal of its intercepts on the three co-ordinate axes is constant . Show that it passes through a fixed point.

9. A variable plane which remain at a constant distance 3p from origin cuts the co-ordinate axes at A,B,C . Show that the locus of the centroid of ABC is $x^{-2} + y^{-2} + z^{-2} = p^{-2}$.

10. Find the image of the point (1,0,0) with respect to the line $\frac{x+1}{-1} = \frac{y-2}{k} = \frac{z-5}{5}$

$\frac{x-1}{2} = \frac{y+1}{3} = \frac{z+10}{8}$. Also find the perpendicular distance.

11. Prove that if a plane has the intercepts a, b, c and is at a distance of p units from the origin, then $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}=\frac{1}{p^2}$.

12. For what value of 'k' the lines $\frac{x+3}{-3}=\frac{y-1}{1}=\frac{z-5}{5}$ and $\frac{x+1}{-1}=\frac{y-2}{k}=\frac{z-5}{5}$ are coplanar. Also , then find the equation of the plane containing them .

Prepared by :

Mrinal Sarma

PGT, MATHS

Gurukul Grammar Senior Secondary School School,

Guwahati ,Assam.

Ph: 09864066569