Mathematics I /Unit II/Part C Questions

Level 1 Questions

1. Find the equation of the sphere that passes through the circle $x^2+y^2+z^2+x-3y+2z-1=0, 2x+5y-z+7=0$.

2. Find the equation of the cone whose vertex is the origin and guiding curve is the circle $x^2+y^2+z^2+4x+2y-6z+5=0, 2x+y+2z+5=0$.

3. Find the angle between the lines of intersection of the plane $x-3y+z=0$ and the cone

$x^2-5y^2+z^2=0$.

Level 2 Questions

1. Find the equation of the tangent plane to the sphere $x^2+y^2+z^2-4x+2y-6z+5=0$ which are parallel to $x+4y+8z=0$. Find their point of contact.

2. Find the equation of the cone which passes through the three coordinate axis as well as the line $3\frac{x}{1}=\frac{y}{-2}=\frac{z}{3}$, $\frac{x}{3}=\frac{y}{-1}=\frac{z}{1}$.

3. Find the equation of the Right circular cylinder of radius 3 and axis $\frac{x-1}{2}=\frac{y-3}{2}=\frac{z-5}{-1}$.

Level 3 Questions

1. Find the centre, radius and area of the circle given by $x^2+y^2+z^2+2x-2y-4z-19=0, x+2y+2z+7=0$.

2. Find the equation of the cone formed by rotating the line $2x+3y=5, z=0$ about the y-axis.

3. Show that the spheres $x^2+y^2+z^2+6y+2z+8=0$ *and* $x^2+y^2+z^2+6x+8y+4z+20=0$ cut orthogonally. Find their plane of intersection and also prove that this plane is perpendicular to the line joining the centres.