B.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

II Year III Semester

Core Major - Paper VI - THREE DIMENSIONAL GEOMETRY

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. Find the equation of the plane through (3, 4, 5) and parallel to 2x + 3y – z = 0.
2. Find the distance between the parallel planes 2x – 2y – z + 3 = 0, 4x – 4y + 2z + 5 = 0.
3. Find the equation of the sphere with centre (-1, 2, -3) and radius 3.
4. Define sphere.
5. Write the condition of orthogonality of two spheres.
6. Find the equation of a cone of second degree which passes through the axes.
7. Define right circular cone.
8. Give the equation of a right circular cone with axis as z – axis.
9. Define cylinder.
10. Give the equation of a right circular cylinder with axis and radius *a*.
11. Give the symmetric form of the equation of a straight line.
12. Give the equation of a straight line through two given points.

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. Find the equation of a plane passing through (3, 1, 2), (3, 4, 4) and perpendicular to   
   5x + y + 4z = 0.
2. Find the angle between the line and the plane 3*x*+ *y* + *z* = 7.
3. Show that the plane 2x – y – 2z = 16 touches the sphere x2 + y2 + z2 - 4x + 2y + 2z – 3 =0 and find the point of contact.
4. Find the equation of the sphere having the circle x2 + y2 + z2 - 2x + 4y - 6z + 7 = 0, 2x – y + 2z = 5 for a great circle.
5. Find the equation of the cone whose vertex is (1, 2, 3) and passes through the circle   
   x2 + y2 + z2 = 4, x + y + z = 1.
6. Find the semi – vertical angle and equation of the right circular cone with vertex at the origin and passing through the circle y2 + z2 = b2, x = a.
7. Find the equation of the cylinder whose generators are parallel to the line x/-1 = y/2 = z/3 and whose guiding curve is x2 + y2 = 9, z = 1.

[P.T.O.]

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Find the equation of a plane passing through (2, -5, -3), (-2, -3, 5) and (5, 3, -3).
2. Find the shortest distance between the lines  . Find also its equation and the points in which it meets the given lines.
3. Find the equation of the curve with vertex at origin and passes through the curve   
   ax2 + by2 + cz2 – 1 = 0 = px2 + qy2 – 2z.
4. A right circular cone has vertex (2, -3, 5). Its axis passes through A(3, -2, 6) and semi vertical angle 30. Find its equation.
5. Find the equation of the right circular cylinder whose axis is (x – 2)/2 = (y – 1)/1 = z/3 and passes through (0, 0, 3).