B.Sc. DEGREE EXAMINATION, APRIL 2018.

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 distance between the parallel planes and .
2. Find the equation of the straight line joining the points and .
3. Find the equation of the sphere which has its centre at the point and touches the plane .
4. Find the equation of the sphere which touches the coordinate plane and whose centre lies in the first octant.
5. Write the general equation to a cone which touches the co-ordinate planes.
6. Find the equation of the cone whose vertex is at the origin and the guiding curve is .
7. A right circular cone has three mutually perpendicular generators. Prove that the semi vertical angle of the cone is .
8. Find the equation of the right circular cone with its vertex at the origin, axis along the z-axis and semi vertical angle is .
9. Define a cylinder.
10. Write the general equation of a right circular cylinder whose axis is the straight line and whose radius is .
11. Prove that the planes are at right angles.
12. Find the centre and radius of the sphere .

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. Find the equation of the plane passing through the points and and perpendicular to the plane .
2. Find the equation of the sphere having the circle for a great circle. Find its centre and radius.

[P.T.O.]

1. Prove that the equation represents a cone.
2. Aright circular cone has its vertex at . Its axis passes through and its semi vertical angle is . Find its equation.
3. Obtain the equation of the right circular cylinder with axis and radius of the guiding circle .
4. Find the image of the point in the plane .
5. Find the equation of the right circular cylinder whose axis is and radius 4.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Find the shortest distance between the lines and . Find also the equation on the line of the shortest distance.
2. Find the condition that the line where should touch the sphere .
3. Find the condition for the equation to represent a cone.
4. Find the semi vertical angle and the equation of the right circular cone having its vertex at origin and passes through the circle .
5. Find the equation of the right circular cylinder described on the circle through the points as a guiding line.