

Paper-III

Co-ordinate Geometry and Linear Programming

Unit-I

Reduction of general equation of second degree Cartesian equations in x-y to their standard forms.

Unit-II

Sphere:

Definition, equation of the sphere, general equation of a sphere, plane section of a sphere, great circle, equation of the circle, intersection of two spheres, intersection of sphere and straight line, tangent line and tangent plane of a sphere, condition of tangency for a line, equation of a tangent plane, condition of tangency of plane and sphere, plane of contact.

Unit-III

Pole and polar plane:

Pole of a plane, polar plane, properties of poles and polar planes, angle of intersection of two spheres, condition of orthogonality.

Unit-IV

Cone:

Definition, equation of cone, intersection with a line, tangent plane, reciprocal cone, three mutually perpendicular generators, right circular cone.

Unit-V

Cylinder:

Definition, equation of a cylinder, enveloping cylinders and its equation, right circular cylinder and its equation.

Unit-VI

Conicoides:

Definitions, central conicoides, standard equation of ellipsoid, hperboloid of one sheet and two sheets, nature and shapes of central conicoides, tangent lines, tangent planes, condition of tangency, director sphere.

Unit-VII

Normal to a conicoid, number of normals, cubic curves, cone through six normals, pole and polar planes, polar lines, section with a given centre, enveloping cone and cylinder.

Unit-VIII

Generating lines of one sheet and its properties.

Unit-IX

Reduction of a general equation of a second degree in three dimension to standard forms.

Unit-X

Linear programming problems.

Problem formulation, L.P.P. in matrix notation, graphical solution of a L.P.P.

Unit-XI

Basic solutions, some basic properties of convex sets, fundamental theorem of L.P.P.

Unit-XII

Application of simplex method for solution of a L.P.P. to simple problems.

Unit-XIII

Duality, fundamental theorem of duality, other theorems and properties.

Unit-XIV

Solving L.P.P. through duality.

Unit-XV

Assignments and Transportation problems.