

Cluster University, Srinagar

Syllabus for B.A./B.Sc. 5th Semester

Subject: Mathematics

**Course Title: Solid Geometry and Advanced
Calculus**

Course Code: MA17501 [DSC]

Total Credits: 06

Distribution of Marks

End-Term Examination: 56 Attendances: 04

Internal Assessment: 28 Attendances: 02

Unit I (Sphere, Cone)

Sphere, equation of sphere in various forms, angle between two spheres, condition for two spheres to be orthogonal, radical plane, coaxial system

Cone, vertex, guiding curve, generator, equation of cone with vertex as origin or a given vertex and guiding curve, enveloping cone, condition that the general equation of the second degree should represent a cone, necessary and sufficient conditions for a cone to have three mutually perpendicular generators.

Unit II (Cylinder, Conicoids)

Cylinder, right circular cylinder, equation of the cylinder whose generators intersect a given conic and is parallel to a given line, enveloping cylinder of a sphere

Types of conicoids, central conicoids, tangents and tangent planes, director sphere, normals to a central conicoid, pole and polar planes

Unit III (Advanced Calculus)

Limit and continuity of a function of two or more variables, partial derivatives, directional and total derivative, differentiability of functions of two or more variables, Young's theorem, Schwarz's theorem

Unit IV (Advanced Calculus)

Extreme values of functions of two or three variables, restricted maxima/minima, Lagrange's multipliers, Change of variables, Jacobians, Beta, Gamma functions and relation between them.

Recommended Texts:

1. Analytical Solid Geometry by M. R. Puri
 2. Textbook of Solid Geometry by R.J.T. Bell
 3. Analytical Solid Geometry by Shanti Narayan
 4. Mathematical Analysis by S. C. Malik and Savita Arora
 5. Mathematical Analysis by Tom M. Apostol
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