

REVISED SCHEME OF STUDIES FOR B.A / B. SC MATHEMATICS

TWO YEARS PROGRAMME

The syllabi and courses of reading for B.A/ B. Sc (Mathematics) session of 2016 onward are hereby proposed. There shall be three different courses of studies:

- (i) A-Course of Mathematics
- (ii) B-Course of Mathematics
- (iii) General Mathematics

1. Each course mentioned above shall carry 200 marks.
2. There shall be two papers in each course of study.
3. The students who intend to do M. Sc. Mathematics must opt for both the A & B course of Mathematics or general Mathematics with Physics.
4. The practice of setting unseen question in the question paper of the examination is initiated.
5. To avoid selective studies, each question paper may be divided into maximum possible sections.
6. From the scheme of study the paper I of each course should opt in third year and paper II opt in fourth year.
7. For general Mathematics paper I should opt in third year and paper II opt in fourth year.

A-COURSE OF MATHEMATICS:

PAPER-I: CALCULUS AND ANALYTICAL GEOMETRY. (100 Marks)

Note: Attempt six questions by selecting two questions from section I, one question from Section II and III and two questions from section IV.

Section I (2 questions out of 3 questions)

DIFFERENTIAL CALCULUS

Definition of calculus and its importance, real numbers with their properties, limit, theorems of limit, continuity, differentiability (first and higher order) and their physical significance, Leibnitz's theorem. Rolle's theorem, mean-value theorems(Lagrange's and Cauchy), increasing and decreasing functions, Taylor's and Maclaurin's theorems in finite and infinite forms and their use in expansion of functions in series, Remainder theorem, indeterminate forms and L Hospital's rule, Applications of Rolle's and Mean value theorems and their applications.

Section II (1 question out of 2 questions)

INTEGRAL CALCULUS

Integral definition and its physical significance, definite and indefinite integrals, Riemann's definition of integral, techniques of integration, properties of definite integrals, fundamental theorem of calculus, proper and improper integrals, and reduction formulae, rectification and quadrature, Simple case of double and triple integrals, surfaces and volumes of revolution.

Section III (1 question out of 2 questions)

PLANES CURVES

Curves and their Cartesian, polar and parametric representations, asymptotes, maxima, minima, points of inflection and their application, convexity and concavity, Singular point, curvature, center and radius of curvature, functions of several variables and partial derivatives with special reference to the case of two variable, Euler's theorem and implicit functions, maximum and minimum of functions of more than one variable using Lagrange's multiplier method with or without constant, involute and evolute, arc length and intrinsic equations.

Section IV (2 question out of 3 questions)

ANALYTICAL GEOMETRY

Translation and rotation of axes, general equation of the second degree and the classification of conic sections, conic sections in polar coordinates, tangents and normals, properties of circle, parabola, ellipse, and hyperbola, pedal equations, parametric representation of curves.

Rectangular, cylindrical and spherical polar coordinates system in space, direction angles, direction cosines and direction ratios, equation of line and plane, intersection of planes and line, shortest distance, equations of sphere, cylinder, cone, ellipsoid, paraboloid and hyperboloid, symmetry, intercepts and section of a surface, tangent and normal planes, spherical trigonometry and direction of Qibla

