B.A. (2019 Pattern) (Semester - II)

Subject : Mathematics Paper Code: 122B-II

Title of the Paper: Mathematics Paper II : Calculus – II

Unit 1 : Differentiation

1 .1. The Derivatives:

Definition of the derivative of a function at a point, every differentiable function is continuous, Rules of differentiation, Caratheodary's theorem (without proof), The chain rule, Derivative of inverse function (without proof, only examples).

1 .2 The Mean Value Theorems:

Interior extremum theorem, Mean Value theorems and their Consequences, Intervals of increasing and decreasing of a function, first derivative test for extrema

Unit 2 : L' Hospital Rule and Successive Differentiation

2.1L'Hospital Rule: Indeterminate forms, L'Hospital Rules (without proof)

2.2Taylor's theorem: Taylor's theorem and Maclaurin's theorem with Lagrange's form of remainder (Without proof).

2.3. Successive Differentiation: The nth derivative and Leibnitz theorem for successive differentiation.

Unit 3 : Ordinary Differential Equations

3.1 Linear first order equations.

3.2 Separable equations.

3.3 Existence and Uniqueness of solutions of nonlinear equations.

Unit 4: Exact Differential Equations

4..1 Transformation of nonlinear equations to separable equations.

4..2 Exact differential equations.

4..3 Integrating factors.