BCA – 113   Mathematical Foundations – I

Maximum Marks: 100   **External: 80**
Minimum Pass Marks: 35   **Internal: 20**
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT- I

Set, subsets and operations on sets, Venn diagram of sets. Power set of a set.
Equivalence relation on a set and partition of a set, Permutation and combinations, Partially ordered sets, Lattices (definition and examples). Boolean algebra (definition and examples)

UNIT- II

Epsilon and delta definition of the continuity of a function of a single variable, Basic properties of limits, Continuous functions and classifications of discontinuities, Derivative of a function, Derivatives of Logarithmic, exponential, trigonometric, inverse trigonometrical and hyperbolic functions. Higher order derivatives.

UNIT- III

Formation of differential equations order and degree of the differential equation, Geometrical approach to the existence of the solution of the differential equation dy/dx=f (x,y). Ordinary differential equations of first degree and the first order, exact differential equations

UNIT- IV

Linear differential equations of higher order with constant coefficients, Homogeneous linear differential equations and linear differential equations reducible to homogenous differential equations, Applications of differential equations to geometry,

REFERENCE BOOKS
1.   D.A. Murray: Introductory course in differential equations, Orient Lengaman(India).
2.   H.T.H. Piaggio: Elementary Treatise on differential equation and their applications C.B.S. publishers of distributors.
3.   S.L. Ross : Ordinary differential equations
4.   Babu Ram: Discrete Mathematics
5.   Shanti Narayana : Differential & Integral calculus