SYLLABUS FOR MASTER OF COMPUTER APPLICATION (MCA)

UNIT-I: MATHEMATICS

Logic: Statement, negation, implication, converse, contra positives, conjuction, disjunction, truth Table.

Algebra of Sets: Set operations, union, intersection, difference, symmetric difference, complement, Venn diagram, cartesian products of sets, relation and function, composite function, inverse of a function, equivalence relation, kinds of function.

Number Systems: Real numbers (algebraic and other properties, rational and irrational numbers), complex numbers, algebra of complex numbers, conjugate and square root of a complex number, cube roots of unity, De-Moivre's theorem with simple application. Permutation and combinations and their simple applications, mathematical induction, binomial theorem. Determinants upto third order, minors and cofactors, properties of determinants. Matrices upto third order, types of matrices. Algebra of matrices, adjoint and inverse of a matrix. Application of determinants and matrices to the solution of linear equations (in three unknowns).

Trigonometry: Compound angles, multiple and sub-multiple angles, solution of trigonometric equations, properties of triangles, inverse circular functions.

Co-ordinate Geometry of two dimensions: Straight lines, pairs of straight lines, circles, equations of tangents and normals to a circle. Equations of parabola, ellipse and hyperbola, ellipse and hyperbola in simple forms and their tangents (focus, directix, eccentricity and latus rectum in all cases).

Co-ordinate Geometry of Three Dimensions: Distance and division formulae, direction cosines and direction ratios. Projections, angles between two planes, angle between a line and a plane, distance of a point from a line and plane. equations of a sphere-general equation. Vectors: Fundamentals, dot and cross product of two vectors, scalar triple product, simple applications (to geometry, work and moment).

Differential Calculus: (Concept of limit, continuity, derivation of standard functions, successive differentiation (simple cases, Leibnitz theorem, partial differentiation (simple cases, derivatives as rate measure, maxima and minima indeterminate forms, geometrical applications such as tangents and normals to plane curves.

Integral calculus: Standard methods of integration (substitution, by parts, by partial fractions etc.). Definite integrals and properties of definite integrals, areas under plane curves, differential equations (only simple cases).
(i) $dy/dx = f(x)$ (ii) $dy/dx = f(x)\ g(y)$ (iii) $d2y/dx2 = f(x)$ and application to motions in a straight line with constant acceleration.

Probability and Statistics: Averages (mean, median and mode), dispersion (standard deviation and variance). Definition of probability; mutually exclusive events. independent events, addition theorem.

UNIT-II: COMPUTER AWARENESS

Introduction to Computer: Brief history of computers, components of a computer, computer related general knowledge, application of computers, classification of computers, simple DOS commands.

Computer Arithmetic: Number system with general base, number base conversion, elementary arithmetic operation. BASIC Language Programming: Flow charts, algorithms, constants, variables, arithmetic and logical expression, elementary BASIC statements, writing simple programs (using sequence, repetition and control structures),
'subscripted variables, matrix operations function and subroutines, concept of Files.

Note: The question will cover the entire course and will be multiple choice type.