# GENERAL MCA SYLLABUS

## COURSE CONTENTS

**The Institute abides mainly by the following syllabus :**

## MATHEMATICS

## ALGEBRA

**Sets, Relations, Functions, Elementary Number Theory Including the relation of congruence Modulo, Simultaneous linear / quadratic equations, Indices, Logarithms, Arithmetic, Geometric and Harmonic progressions, Binomial theorem, Surds, Complex numbers, Demoivre's theorem and its simple application**

## MATRICES AND DETERMINANTS

**Matrix operations, Definition and properties of determinats, Cofactors, Adjoint, Elementry Transformations, Rank and inverse of a Matrix, Matrix Polynomial, Characteristic Equations,Eigen Values, Latent Vectors, Caylay Hamilton theorem, Linear system of Equations**

## THEORY OF EQUATIONS

**Polynomials and their charcteristics, Roots of an equation, Relations between Roots and Coefficients,Transformation of Equations, Symmetric function etc.**

## ABSTRACT ALGEBRA

**Groups, Cyclic groups, Subgroups, Normal Groups, Lagrange's theorem, Homomorphism, Isomorphism, Ring, Field, Vector Spaces, Linear Independence of Vectors, Basis, Dimension, Linear Transformation and diagonalisation of Matrices etc**

## VECTOR ALGEBRA

**Scalar and Vector quantities their representation, Addition and subtraction of vectors, Scalar and vector product of two vectors, Scalar triple product, Expansion formula of Vector triple product**

## TRIGONOMETRY

**Simple identities, trignometric equations, Properties of triangles, Solution of triangle, Height and distance, Inverse function**

## CALCULAS AND REAL ANALYSIS

**Real number system, Concept of neighborhood and limit points, Continuity and limits, Indeterminate forms, properties of continuous functions in closed interval, Differentiation, Successive Differentiation, Maxima Minima, Roll's theorem, Mean value theorems, Maclaurine's series and Taylor's series, Integration, definite integral, Evaluation of length, Area and volume of curves, Curvature, Asymptotes, Tracing of curves, Partial Differentiation, functions of two variables, definition of partial derivates, Total differentiation, Sequence, Sequence of**

real numbers, Convergent Sequences, Cauchy Sequences, Monotonic Sequences, Infinite series of positive terms and their different test of convergence,Alternating infinite series and Leibnitz's test of convergence, Absolute convergence, Conditional convergence, Uniform Convergence, Multiple integration, Change of order and change of variables, Application to evaluation of Area, Surface and volume.

## DIFFERENTIAL EQUATIONS

Differential equations of first order and their solutions, Linear differential equations with constant coefficients, Homogenous linear differential equations, Orthogonal Trajectories, Singular solutions.

## COORDINATE GEOMETRY

### 2-d :

Pair of straight lines, Transformation of coordinate system, Circles, Parabola, Ellipse and Hyperbola, Pair of tangents from a point, Chord of contact, Equation of chord in terms of middle

**point, Diameter of Conic, Conjugate diameter, Classification of curves of second degree.**

**3-d :**

**Introduction to lines and planes, Spheres, Quadric Cones and Cylinders.**

**LINEAR PROGRAMMING**

**Linear inequalities with two variables, Mathematical formulation of L.P.P, Basic concepts of graphical and Simplex method.**

**NUMERICAL ANALYSIS**

**Interpolation, Extrapolation, Quadrature formula, Simpson's 1/3rd rule, Trapezoidal rule, Solution of non-linear equations using iterative methods, Numerical differentiation.**

**STATISTICS**

**Classifications of Data and frequency distribution, Calculation of measures of Central tendency and measures of dispersion, Skewness and Kurtosis, Permutation and Combination, Probability, Random variables and distribution functions, Mathematical expectations and generating functions, Binomial, Poisson, Geometric, Exponential and Normal distributions, Curve fitting and principal of least square, Correlation and Regression,Index numbers and their importance,Simple Time Series analysis, Sampling and large sample tests,test of significance based on t, Chi-square and F distributions**

## COMPUTER AWARENESS

## COMPUTER BASICS

**Organization of a computer, Central Processing Unit (CPU), Structure of instructions in CPU, input / output devices, computer Memory, memory organization, back-up devices.**

## DATA REPRESENTATION

**Representation of characters, integers, and fractions, binary and Hexadecimal representations**

**BINARY ARITHMETIC**

**Addition, subtraction, division, multiplication, single arithmetic and two complement arithmetic, floating point representation of numbers, normalized floating point representation, Boolean Algebra, truth tables, Venn diagrams**

**COMPUTER ARCHITECTURE**

**Block structure of computers, communication between processor and I / O devices, interrupts**

**COMPUTER LANGUAGE**

**Assembly language and high level language, Multiprogramming and time sharing operating systems, Computer Programming in C**

## MATHEMATICAL LOGIC

**Venn Diagrams in logic, Logical operators, Negations, Logical Equivalence and Tautology**

## FLOW CHART AND ALGORITHMS

## BASICS OF DATA STRUCTURE

## ANALYTICAL ABILITY AND LOGICAL REASONING

**This part of the syllabi deals with enhancing candidates logical reasoning, quantitative reasoning and visuo-spatial Reasoning besides grooming the students to deal with practical logical situations in the best possible manner.**

## ELEMENTARY ENGLISH AWARENESS

**Basic English Awareness of the students would be enriched to cater to the needs of a MCA Entrance Examination The institute heartily welcomes the feedback from its passed-out students pursuing MCA course form different Universities as well as its enrolled students also with many other multifarious topics to supplement its syllabus with broader unforeseen up to date topics. The institute vows to remain abreast of every additional information in the study curriculum and pledges to transport them inside the cerebral cavity of the students.**

**Note :-**

**The aforesaid study-content is open to any modification and / or alteration depending upon the amenable factors and conditions.**

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