MONTHLY SYLLABUS

SESSION-2016-17

CLASS-XI

SUBJECT : MATHEMATICS

MONTH	CONTENTS
July 2016	**SETS**: Sets and their representations. Empty sets. Finite and infinite sets, types of sets, subsets of a set, power set, universal set, intervals. Venn diagram, algebra of sets, set operations, properties of complement of a set, application of sets. **Relations and Functions**: Ordered, pair, Cartesian product of sets. Number of elements in Cartesian product of two finite sets. Cartesian product of set of real with itself (upto R×R×R). Definition of relation, pictorial diagrams, domain, co-domain and range of relation. Function as a special kind of relation from one set to another. Pictorial representation of a function. Domain, co-domain, range of a function (real valued). Some special type of functions with their graphs, domain and range. Sum, difference, product and quotient of two functions. Concept of exponential and logarithmic functions. **Trigonometric Functions** : Positive and negative angles, measuring angles in radians and in degrees, conversion from one measure to another. Definition of trignometric functions, domain and range of trignometric functions and their graphs. Deducing the identities of trignometric functions of sum and difference of angles, expressing the sum and difference of trignometric functions as product. Deducing simple identities. Identities involving multiple of angles, principal and general solution of

	trignometric equations, proof and simple applications of sine and cosine formula. YUVA Session:
August 2016	**Principle of Mathematical Induction**: Process of proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple application. **Complex Numbers and Quadratic Equations**: Need for complex numbers, especially square root of –1, to be motivated by inability to solve some of the quadratic equations, algebric properties of complex numbers., Argand's plane and polar representation of complex numbers, square root of complex numbers. **Equations**: Statement of fundamental theorem of algebra, solution of quadratic equations in complex number system. **Linear Inequalities** : Graphical solutions of linear inequalities in two variables, graphical solution of system of linear inequalities in two variables. YUVA Session:
September 2016	**Permutations and Combination**: Fundamental Principle of Counting, Factorial n. (n!) Premutations and combinations, derivation of formulae and their connection, simple applications. **PRACTICE FOR PSA** **REVISION FOR SA-1**
	SA-1 EXAMS

October 2016	**Discussion of Question Paper of SA-1** **Binomial Theorem** : History, statement and proof of binomial theorem and positive integral indices, Pascal's triangle, general and middle term in binomial expansion. Simple applications of binomial theorem. **Sequence and Series**: Sequence and series, arithmetic progression, arithmetic mean, geometric progression, general term of a G.P. Interdisciplinary problems. Sum to n terms of a GP, arithmetic and geometric series, infinite GP and its sum, geometric mean. Relation between AM and GM, sum to n terms of special series.
	AUTUMN BREAK
November 2016	**Straight Lines**: Brief recall of two dimensional geometry from earlier classes, shifting of origin, slope of a line, angle between two lines, various forms of equations of a line, parallel to axes, point slope form, slope intercept form, two point-forms, intercept form and normal form. General equation of a line, equation of family of lines passing through the line of intersection of two lines, distance of a point from a line. **Conic Sections**: Section of a cone: circle, ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section, standard equation of circle. Standard equations and simple properties of ellipse, standard equation and simple properties of hyperbola and parabola. Interdisciplinary problems. **Three Dimensional Geometry** : Co-ordinate axes and co-ordinate planes in three dimensions, coordinates of a point,

	distance between two points and section formula.
December 2016	**Limits and Derivatives** : Concept of limit of a function, some standard results and theorems on limit such as : $\lim_{x \to 0} \frac{\sin}{x}$ 1, $\lim_{x \to 0} \frac{1 \quad \cos x}{x}$ 0, $\lim_{x \to 0} \frac{e^x \quad 1}{x}$ 1 $\lim_{x \to 0} \frac{\log_e(1 \quad x)}{x}$ 1, $\lim_{x \to 0} \frac{x^n \quad a^n}{x \quad a}$ $na^{n \ 1}$. Limits of polynomials and rational functions, trignometric, exponential and logarithmic functions, definition of derivative, relate to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trignometric functions. **Mathematical Reasoning** : Mathematically acceptable statements, connecting words/phrases consolidating the understanding of if and only if (necessary and sufficient) condition, “implies”, “and/or”, “implied by”, “and”, “or”, “there exists”, “for every” and their use through variety of example related to real life and mathematics. Validating the statements, involving the connecting words, difference between contradiction, converse and contrapositive. **Statistics**: Measures of dispersion, mean deviation of ungrouped/grouped data about mean and median. YUVA Session:
January 2017	**WINTER BREAK** Contd... **Statistics**: Variance and standard deviation of ungrouped and grouped data, analysis of frequency distribution

	with equal means but different variances. **Probability**: Random experiment: outcomes, sample spaces (set representation), events; occurrence of events, “not”, “and” and “or” events, exhaustive events, mutually exclusive events.
February 2017	Contd... **Probability :** Axiomatic (set theoretic) probability, connections with the theories of earlier classes, probability of an event, probability of “not” “and” and “or” events.
	REVISION UNITS : 1, 2, 3, 4, 5, 6, 8, 9, 10, 13, 15, 16 **ANNUAL EXAMS**
March 2017	**RESULT**