

**KENDRIYA VIDYALAYA SANGATHAN: BHUBANESWAR REGION**  
**MATHEMATICS (041) Class: XI**  
**SPLIT UP SYLLABUS ( Session – 2015- 16)**

SL NO	MONTH	DISTRIBUTION OF SYLLABUS	No. Of Periods
1	June, July	<p><b>Sets :</b>  Sets and their representations. Empty set. Finite &amp; Infinite sets. Equal sets. Subsets. Subsets of these to real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set.</p>	20
		<p><b>Relations &amp; Functions :</b>  Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of these also with itself (up to <math>R \times R \times R</math>).  Definition of relation, pictorial diagrams, domain, Codomain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain &amp; range of a function. Real valued function of these all variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions.</p>	20
		<p><b>Trigonometric Functions:</b>  Positive and negative angles. Measuring angles in radians &amp; in degrees and conversion from one measure to another.  Definition of trigonometric functions with the help of unit circle. Truth of the identity <math>\sin^2 x + \cos^2 x = 1</math>, for all <math>x</math>. Signs of trigonometric functions and sketch of their graphs.</p>	05
2	August	<p><b>Trigonometric Functions: Continued.....</b>  Expressing <math>\sin(x+y)</math> and <math>\cos(x+y)</math> in terms of <math>\sin x</math>, <math>\sin y</math>, <math>\cos x</math> &amp; <math>\cos y</math>. Deducing the identities like the following:  <math display="block">\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x},</math> <math display="block">\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}, \cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2},</math> <math display="block">\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}, \cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2},</math> Identities related to <math>\sin 2x, \cos 2x, \tan 2x, \sin 3x, \cos 3x</math> and <math>\tan 3x</math>. General solution of trigonometric equations of the type <math>\sin \theta = \sin \alpha</math>, <math>\cos \theta = \cos \alpha</math> and <math>\tan \theta = \tan \alpha</math>.</p>	15
		<p><b>Principle of Mathematical Induction:</b>  Processes of the 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 applications</p>	10
		<p><b>Complex Numbers and Quadratic Equations:</b>  Need for complex numbers, especially, to be motivated by inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, Solution of quadratic equations in the complex number system. Square root of a complex number.</p>	15

3	September	<p><b>Linear Inequalities:</b> Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables-graphically.</p> <p><b>Permutations &amp; Combinations:</b> Fundamental principle of counting. Factorial <math>n</math>. (<math>n!</math>). Permutations and combinations, derivation of formulae and their connections, simple applications</p> <p><b>Binomial Theorem:</b> History, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, General and middle term in binomial expansion, simple applications.</p> <p><u>Sequence and Series.</u> Arithmetic progression (A.P.), arithmetic mean (A.M.) Geometric progression (G.P.), general term of a G.P.,</p>	10  10  10 15
4	October	<p>Sequence and Series Continued..... Sum of <math>n</math> terms of a G.P., geometric mean (G.M.), relation between A.M. and G.M. Sum to <math>n</math> terms of the special series</p> <p><b>Straight Lines:</b> Brief recall of 2D from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two point form, intercept form and normal form. General equation of a line. Distance of a point from a line.</p> <p>Conic Sections: Sections of a cone: circle</p>	10  15
5	November	<p>Conic Sections: Continued..... Ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle. REVISION FOR HALF YEARLY EXAMINATION</p>	
6	December	<p><b>Introduction to Three-dimensional Geometry</b> Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.</p> <p><b>Limit and differentiation:</b> Derivative introduced as rate of change both as that of distance function and geometrically, intuitive idea of limit. Limits of polynomials and rational functions, trigonometric, exponential and logarithmic functions. Definition of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.</p>	10  20
7	January	<p><b>Mathematical Reasoning:</b> 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" and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words difference between contradiction, converse and contra positive.</p> <p>Statistics: Measures of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.</p> <p>Probability: Random experiments: outcomes, sample spaces (set representation). Events: occurrence of events, 'not', 'and' and 'or' events</p>	10  15
8	February	<p>Probability: Continued..... Exhaustive events, mutually exclusive events Axiomatic (set the or etc) probability, connections with the theories of earlier classes. Probability of an event, probability of 'not', 'and' &amp; 'or' events. REVISION FOR SESSION ENDING EXAM</p>	15

