# CARMEL CONVENT SR SEC SCHOOL ,RATANPUR,BHOPAL.

## *ACADEMIC PLAN :2023-24*

**STD: XI** **SUBJECT: MATHEMATICS (041)**

| Month / No of Working Days | Name of the Unit / Chapter/Topic | Learning Outcomes | Suggested Activities/ Projects under Internal Assessment/PRACTICALS | Assignment | Assessment |
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| JUNE | ***SETS***<br>Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of a set of real numbers especially intervals (with notations). Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement. | develops the idea of Set from the earlier learnt concepts in number system , geometry etc. | | Powerpoint presentation on Sets | |
| JULY | ***RELATIONS AND FUNCTIONS***<br>Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs. Sum, difference, product and quotients of functions.<br><br>***Trigonometric Functions***<br>Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth ofthe identity sin2x + cos2x = 1, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin (x±y) and cos (x±y) in terms of sinx, siny, cosx & cosy and their simple applications<br>***Complex Numbers and Quadratic Equations***<br>Need for complex numbers, especially$\sqrt{-1}$, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane | identifies relations between different sets.<br><br>relates earlier learnt concept of trigonometric ratios to functions and evolves the idea of trigonometric functions.<br><br>Extends the idea of real numbers to a larger system of complex numbers. | 1. To verify distributive law for three given non-empty sets A, B and C, that is Au(B∩C) =(AuB) n(AuC). | Graphs of trigonometric functions | ***PT-1***<br>**SETS AND RELATIONS AND FUNCTIONS** |

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| AUGUST | ***Linear Inequalities***<br>Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line<br><br>**Permutations and Combinations**<br>Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, derivation of Formulae for ${}^{n}P_{r}$ and ${}^{n}C_{r}$ and their connections, simple applications.<br>**Binomial Theorem**<br>Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications. | Demonstrates strategies for solving systems of linear inequalities.<br>Applies the ideas of permutations and combinations to daily life situations of arranging and grouping the objects.<br>Develops the idea of Binomial theorem<br>For a positive integral index from the earlier learnt concept of finding squares and cubes of binomials. | 2. To verify the graph of the given inequality and representation on half plane<br><br>3. To find the number of ways in which three cards can be selected from given five cards<br><br>4. To construct a Pascal's triangle and to write binomial expansion for a given positive integral exponent | Worksheet on Linear Inequalities graphically<br><br>Maths Musings on Binomial Coefficients from Pascal's Triangle | |
| SEPTEMBER | **Sequence and Series**<br>Sequence and Series. Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M. | Extends the ideas related to Arithmetic progressions learnt earlier to new types of sequences and their series. | 5. To demonstrate that the arithmetic mean of two different positive numbers is always greater than Geometric mean. | | **TERM -1 CH 1 TO 7** |
| OCTOBER | **Straight Lines**<br>Brief recall of two dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point -slope form, slope-intercept form, two-point form, intercept form, Distance of a point from a line.<br>**Conic Sections**<br>Sections of a cone: circles, ellipse, parabola, hyperbola, a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. | Constructs different forms of a straight line using the earlier learnt concepts of coordinate geometry.<br><br>Analyses different curves like circles, ellipses, parabolas and hyperbolas based on the ideas developed for straight lines using coordinates. | | Worksheet on Straight Lines<br><br>NCERT EXAMPLES | |

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| | Standard equation of a circle. | | | | |
| NOVEMBER | **Introduction to Three-dimensional Geometry**<br>Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points.<br><br>**Limits and Derivatives**<br>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 scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.<br>**Statistics**<br>Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. | Develops strategies of locating a point In three dimensions based on the concepts of two dimensional coordinate geometry.<br>Evolves the concepts of limit and derivative of a function by analyzing the behaviour of functions when the corresponding variable approaches a certain value.<br><br>Applies Measures of dispersion to get a better interpretation of data of different daily life situations. | | EXTRA QUESTIONS FROM NCERT EXEMPLAR | |
| DECEMBER | **Probability**<br>Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with other theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events. | Builds up the axiomatic approach to Probability through the terms, random experiment, Sample space, events etc. | | EXTRA QUESTIONS FROM NCERT EXEMPLAR | **PT- 2 (CH 9, CH 11, CH 12 )** |
| JANUARY | **REVISION** | | | | |
| FEBRUARY | **TERM- 2 EXAM** | | | | **TERM-2 FULL COURSE** |

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SIGNATURE OF THE SUBJECT COORDINATOR: