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YEARLY SYLLABUS OF MATHEMATICS

SESSION – 2025-2026

STD – XI

MONTH	WORKING DAYS	TOPIC TO BE TAUGHT	ACTIVITY	LEARNING OUTCOME	VALUES & SKILLS IMPARTED	ASSESSMENT
APRIL	21	**1. Sets** Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of a set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets. **2. Relations & Functions** Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of real with itself (R x R only). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain	To find the number of subsets of a given set and verify that if a set has *n* number of elements, then the total number of subsets is 2^n. To distinguish between a Relation and a Function.	Students will be able to : ● Define set as well-defined collection of objects ● Represent a set in Roster form and Set builder form ● Identify different types of sets on the basis of number of elements in the set ● Differentiate between equal set and equivalence set ● Enlist all subsets of a set	Relation and Function in real life give us the link between any two entities. In our daily life, we come across many patterns and links that characterize relations such as a relation of a father and a son, brother and sister, etc.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

		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.		● Find number of subsets of a given set ● Find number of elements of a power set ● Express subset of real numbers as intervals ● Apply the concept of Venn diagram to understand the relationship between sets ● Solve problems using Venn diagram ● Perform operations on sets to solve practical problems ● Explain the significance of specific arrangement of elements in a pair ● Write		

				Cartesian product of two sets ● Find the number of elements in a Cartesian product of two sets ● Explain the significance of specific arrangement of elements in a pair ● Write Cartesian product of two sets ● Find the number of elements in a Cartesian product of two sets ● Define and illustrate different types of relations: Empty relation and universal relation		

				● Examine whether the relation is equivalence or not ● Define function as a special type of relation ● Categorize relations that are functions and non-functions Topics of Assessment : 1. Sets 2. Relations and Functions		
MAY	9	**3. Trigonometric Functions** 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 of the identity sin2x + cos2x = 1, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin ($x \pm y$) and cos ($x \pm y$) in terms of sin$x$, sin$y$, cos$x$ & cos$y$	To prepare a model to illustrate the values of sine function and cosine function for different angles which are multiples of $\pi$and $\frac{\pi}{2}$.	* Identify the hypotenuse, adjacent side and opposite side of an acute angle in a right triangle. Determine the six trigonometric ratios for a given angle in a right triangle.	* Trigonometric functions are equal to 0, 1, -1, or undefined when the angle lies on an axis, meaning that the angle is equal to 0°,90°,180° or 270° degrees (0, $\frac{\pi}{2}$, $\frac{3\pi}{2}$ in radian). Trigonometric	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked

		and their simple applications. Deducing identities like the following: tan(x±y)=tanx±tany1∓tanxtany ,cot(x±y)=cotxcoty ∓1coty±cotx sinα±sinβ=2sin12(α±β)cos12(α∓β) cosα+cosβ=2cos12(α+β)cos12(α−β) $cos\alpha - cos\beta = -2sin12(\alpha+\beta)sin12(\alpha-\beta)$ Identities related to sin2x, cos2x, tan2 x, sin3x, cos3x and tan3x.		Recognize the reciprocal relationship between sine / cosecant, cosine / secant and tangent / cotangent. Topics of Assessment : 1. Trigonometric Functions	functions are undefined when they represent fractions with denominators equal to zero.	* Short & Long type questions will be asked * Case-study based Questions will be asked
JUNE	11	**4. Complex Numbers** Need for complex numbers, especially√−1, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane. Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system	To interpret geometrically the meaning of $i = -1$ and its integral powers.	* Differentiate between Real and Imaginary Numbers * To plot Complex Number on Argand Plane * Find the solution of Quadratic Equations Topics of Assessment : 1. Complex Numbers	Improving Students' Algebraic Skills in the Learning of Complex Numbers	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked
JULY	26	**5. Sequence and Series**	To demonstrate	● Differentiate	Students	* Exercise

		Sequence and Series. Arithmetic Progression (A. P.). 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.	that the Arithmetic mean of two different positive numbers is always greater than the Geometric mean.	between sequence and series ● Identify Arithmetic Progression (AP) ● Establish the formulae of finding nth term and sum of n terms ● Solve application problems based on AP ● Find arithmetic mean (AM) of two positive numbers ● Identify Geometric Progression (GP) ● Derive the nth term and sum of n terms of a given GP ● Solve problems based on applications	creative thinking skills in solving two dimensional arithmetic series through research based learning	Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

				of GP ● Find geometric mean (GM) of two positive numbers ● Solve problems based on relation between AM and GM ● Apply appropriate formulas of AP and GP to solve application problems Topics of Assessment : 1. Sequence and Series		
AUGUST	24	**6. Linear Inequalities** 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. Graphical method of finding a solution of system of linear inequalities in two variables	To verify that the graph of a given inequality, say $5x + 4y - 40 < 0$, of the form $ax + by + c < 0$, $a, b > 0$, $c < 0$ represents only one of the two			* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based

		7. Straight Lines 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 and normal form. General equation of a line. Distance of a point from a line.	half planes. To verify that the equation of a line passing through the point of intersection of two lines $a_1x + b_1y + c_1=0$ and $a_2x + b_2y + c_2 = 0$ is of the form $(a_1x + b_1y + c_1) + \lambda (a_2x + b_2y + c_2) = 0.$.	● Find the slope and equation of line in various form ● Find angle between the two lines ● Find the perpendicular from a given point on a line ● Find the distance between two parallel lines Topics of Assessment : 1. Linear Inequalities 2. Straight Lines	Understand that a straight line has an angle measurement of 180 degrees	Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked
SEPTEMBER	21	**Revision &Half Yearly Exam**				
OCTOBER	18	**8. Limits** Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and		Define limit of a function ● Solve problems based	Students' critical thinking skills towards the relationship	* Exercise Questions & Answers to be

		logarithmic functions **9. Derivatives** Derivative introduced as rate of change both as that of distance function and geometrically. 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.		on the algebra of limits * Find the distance between two points in 3D space * Ratio in which the line is divided in 3D space ● Find the derivative of function of a function Topics of Assessment : 1. Limits and Derivatives	between the concepts of continuity and derivatives of functions	assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked
NOVEMBER	23	**10. Permutations & Combinations** Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, formula for nPr and nCr, simple applications. **11. Conics** Sections of a cone: circles, ellipse, parabola, hyperbola. Standard equations and simple properties of	To construct different types of conic sections.	● Define permutation ● Apply the concept of permutation to solve simple problems ● Define	Arranging people, digits, numbers, alphabets, letters, and colours are examples of permutations. Selection of menu, food, clothes,	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be

		parabola, ellipse and hyperbola. Standard equation of a circle.		combination ● Differentiate between permutation and combination ● Apply the formula of combination to solve the related problems Define parabola, ellipse, hyperbola and related terms ● Define eccentricity of a parabola, ellipse and hyperbola ● Derive the equation of parabola , ellipse and hyperbola Topics of Assessment : 1. Permutations and Combinations 2. Conics	subjects, the team are examples of combinations.	asked * Short & Long type questions will be asked * Case-study based Questions will be asked

DECEMBER	19	**12. Introduction to 3D Geometry** Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula. **13. Binomial Theorem** Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications.	To explain the concept of octants by three mutually perpendicular planes in space.	* Find the distance between two points in 3D space * Ratio in which the line is divided in 3D space • Identify binomial coefficients given the formula for a combination. • Expand a binomial using the binomial theorem. • Use the binomial to find a single term in a binomial. Topics of Assessment : 1. Introduction to 3D Geometry 2. Binomal Theorem	• Statistical and Probability Analyses • Weather Forecast Services • Architecture, estimating cost in engineering projects	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

JANUARY	22	**14. Probability** Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Probability of an event, probability of 'not', 'and' and 'or' events.	To write the sample space, when a die is rolled once, twice…	* Different types of events like sure event, impossible event, equally likely event and occurrence of events. Random experiment, outcomes, sample space (set representation including one coin, two coins, three coins, four coins, one die, two dice, playing cards). Mutually exclusive events, exhaustive events, mutually exclusive & exhaustive events. Probability of the events with the special word : 'not' 'or' 'and' 'at least' 'at most'	* It is used in analysing games of chance, genetics, weather prediction, and a myriad of other everyday events. Statistics is the mathematics we use to collect, organize, and interpret numerical data.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

		7. Statistics Measures of Dispersion: Range, mean deviation, variance and standard deviation of ungrouped/grouped data.		● Understand meaning of dispersion in a data set ● Differentiate between range, quartile deviation, mean deviation and standard deviation ● Calculate range, quartile deviation, mean deviation and standard deviation for ungrouped and grouped data set ● Choose appropriate measure of dispersion to calculate spread of data Topics of Assessment : 1. Probability 2. Statistics	Statistics skills are capabilities and competency traits that allow someone to use statistics in order to gauge the probability of a particular outcome. Statistics are generally a combination of several qualifying traits, including math, computer literacy, data analysis and critical thinking	
FEBRUARY	22	**Revision &Annual Exam**				