ARMY PUBLIC SCHOOL,GOPALPUR

Split-up Syllabus (Session – 2020-21)

CLASS XII - MATHEMATICS (041)

Month	No. of working days	UNIT	LESSONS/ TOPICS TO BE COVERED	No. of Periods
March-April	**9**	**Unit-I**	**Ch-1- Relations and functions** Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function.	15
June	**25**	**Unit-I** **Unit-II**	**Ch-2 - Inverse Trigonometric function** Definition, range, domain, principal value branch. Graphs of inverse trigonometric functions.Elementary properties of inverse trigonometric functions. **Ch-3- Matrix** Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2).Concept of elementary row and column operations. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).	15 25
July	**26**	**Unit-II** **Unit-III**	**Ch-4- Determinant** Determinant of a square matrix (up to 3 x 3 matrices), properties of determinants, minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix. **Ch-5- Continuity & Differentiability** Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions.	25 10

August	**24**	**Unit-III**	**Ch-5- Continuity & Differentiability (Continued...)** Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretation **Ch-6- Application of Derivatives** Applications of derivatives: rate of change of bodies, increasing/decreasing functions, tangents and normals, use of derivatives in approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations). **Ch-7- Integrals** Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them. $\int \frac{dx}{x^2 \pm a^2}$, $\int \frac{dx}{\sqrt{x^2 \pm a^2}}$, $\int \frac{dx}{\sqrt{a^2 - x^2}}$, $\int \frac{dx}{ax^2+bx+c}$, $\int \frac{dx}{\sqrt{ax^2+bx+c}}$, $\int \frac{px+q}{ax^2+bx+c}\,dx$, $\int \frac{px+q}{\sqrt{ax^2+bx+c}}\,dx$, $\int \sqrt{a^2 \pm x^2}\,dx$, $\int \sqrt{x^2 - a^2}\,dx$, $\int \sqrt{ax^2+bx+c}\,dx$, $\int (px+q)\sqrt{ax^2+bx+c}\,dx$ Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.	10 10 20
September	**21**	**Unit-III**	**Ch-8- Application of Integrals** Applications in finding the area under simple curves, especially lines, circles/parabolas/ellipses (in standard form only), Area between any of the two above said curves (the region should be clearly identifiable). **Ch-9- Differential Equations** Definition, order and degree, general and particular solutions of a differential equation.Formation of differential equation whose general solution is given.Solution of differential equations by method of separation of variables solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type: $dy/dx + py = q$, where p and q are functions of *x* or constants. $dx/dy + px = q$, where p and q are functions of y or constants	15 15

		Unit-IV	**Ch-10- Vectors** Vectors and scalars, magnitude and direction of a vector.Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors, scalar triple product of vectors.	15
October	18	**Unit-V**	**Ch-11- Three Dimensional Geometry** Direction cosines and direction ratios of a line joining two points.Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines.Cartesian and vector equation of a plane.Angle between (i) two lines, (ii) two planes, (iii) a line and a plane.Distance of a point from a plane. **Ch-12- Linear Programming** Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions(bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).	15 20
November	**20**	**Unit-VI**	**Ch-13- Probability** Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution, mean and variance of random variable. Repeated independent (Bernoulli) trials and Binomial distribution. Revision for 1st Pre-Board	30
December	19		Revision for 2nd Pre-Board	
January			Revision for Board Exam	
February			Revision for Board Exam	

Note: 1. The number of periods mentioned against different chapters are given by CBSE. Since the syllabus is to be completed by 31thOctober, so if required number of periods are not available in any month, those may be compensated by taking extra classes.