

MATHEMATICS
CLASS-XI

UNIT -I SETS AND FUNCTIONS:

1. SETS :

Sets and their representations . Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the Set of real number specially intervals(with notations). Power Set. Universal set. Venn diagram. 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 reals with itself (upto $R \times R \times R$). Definition of Relation, pictorial diagrams, domain, co-domain and range of a relation. Functions 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 function of the real variable, domain and range of these functions, constant, identity, polynomial, rational modulus ,signum and greatest integer functions with their graphs.

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 ,for all x. Signs of trigonometric functions Expressing

$\sin(xy)$ in terms of $\sin x$, $\sin y$, $\cos x$ & $\cos y$. Deducing the identities like it following:
 $\tan(x \pm y) = \frac{\sin(x \pm y)}{\cos(x \pm y)}$, $\cot(x \pm y) = \frac{\cos(x \pm y)}{\sin(x \pm y)}$, $\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$, $\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$
 $\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}$, $\cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}$

Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$.

UNIT-II:ALGEBRA

Complex Numbers and Quadratic Equations:

Need for complex numbers, especially , to be motivated by inability to solve every quadratic equations. Brief descriptions 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 (with real coefficient)

3. 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

4. Permutations & Combinations:

Fundamental principle of counting .Factorial n (n!). Permutation and Combinations, derivation of formulae and their connections, simple applications.

5. Sequence and Series :

Sequence and Series. Arithmetic progression(A.P.) Arithmetic mean(A.M.) Geometric progression(G.P.), General term of G.P., sum of n terms of a G.P., geometric mean(G.M.) relation between A.M. and G.M. ,infinite G.P. and its sum.

UNIT-III CORDINATE GEOMETRY

1.Straight Lines:

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.

2.Conic Section :

Sections of a cone, circle, ellipse, parabola, hyperbola .Standard equation of a circle. Standard equations and simple properties of parabola ,ellipse and hyperbola.

3.Introduction to Three- dimensional Geometry

Co-ordinate Axes and co-ordinate in three dimensions coordinates of a point. Distance between two points and Section formula.

UNIT-IV :CALCULUS:

1. Limits and Derivatives

Derivative introduced as a rate of change both as that of distance function and geometrically. Intuitive idea of limit. 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 .Limits of polynomials and rational functions and trigonometric functions.

UNIT-V Statistics & Probability

STATISTICS :

Measures of dispersion; mean deviation, variance and standard deviation of ungrouped/ grouped data

Probability :

Random experiments outcomes ,sample spaces(set representation). Events: occurrence of events 'not' 'and' and 'or' events, exhaustive events, mutually exclusive events Axiomatic(set theoretic) probability, connections with the theories of earlier classes, Probability of an event, probability of 'not' , 'and' , ' or' events.

Subject Name : Mathematics

Theory Marks : 80

Topic	MCQ (1 mark)	VSA (2 marks)	SA I (4 marks)	LA (5 marks)	Total
Sets , Relation & Functions, Trigonometric Functions	2X1=2	2X2=4	2X4=8	1X5=5	19
<u>Algebra</u> Principle of Mathematical Induction , Comple No & Quadratic Eqn , Permutation & Combination , Binomial Theorem , Sequence & Series	3X1=3	2X2=4	2X4=8	2X5=10	25
Straight Lines , Conic Sections	2X1=2	1X2=2	2X4=8	1X5=5	17
Limits & Derivatives	1X1=1	1X2=2	2X4=8		11
Statistics , Probability	2X1=2	1X2=2	1X4=4		08
TOTAL:					80