Maharashtra State Board of
Secondary & Higher Secondary School, Pune

Department of Mathematics

Subject: Mathematics and Statistics (40)
Standard: Twelve
Faculty: Science

Syllabus

XII Mathematics and Statistics (Theory & Practical Part 1)

Theory Index

Sr. No.	Unit/Topic	Weightage
1	Mathematical Logic	8
2	Matrices	6
3	Trigonometric Functions	10
4	Pair of Straight Lines	6
5	Vectors	12
6	Line and Plane	10
7	Linear Programming	4

Practical Index

Sr. No.	Practical's Name
1	Logic
2	Matrices
3	Trigonometric Functions - I
4	Trigonometric Functions - II
5	Pair of Straight Lines
6	Vectors and Three Dimensional Geometry
7	Line and Plane
8	Linear Programming

Syllabus

Sr. No.	Name of the Topic	Scope of Syllabus
1	Mathematical Logic	- Statement and its truth value. - Logical connective, compound statements. - Truth tables negation of statements and compound statements. - Statement pattern, logical equivalence. - Tautology, contradiction and contingency. - Quantifiers and quantified statements, Duality. - Application of logic to switching circuits, switching table
2	Matrices	- Elementry transformations. - Inverse of a matrix i.Elementary transformation Method ii.Adjoint method - Application of matrices . - Solution of a system of linear equations i.Method of Inversion ii.Method of Reduction
3	Trigonometric Functions	- Trigonometric Equations and their solutions - Solutions of triangle i. Polar co-ordinates ii. Relation between the polar co-ordinates and the Cartesian co-ordinates iii. Solving a Triangle iv. The Sine rule v. The Cosine rule vi. The Projection rule vii. Applications of the Sine rule, the Cosine rule and the Projection rule. - Inverse Trigonometric Functions - Properties, Principal values of inverse trigonometric functions

4	Pair of Straight Lines	- Combined equation of a pair lines. - Homogeneous equation of degree two. - Angle between lines. - General second degree equation in x and y
5	Vectors	- Vectors and their types. - Section formula. - Dot Product of Vectors. - Cross Product of Vectors. - Triple Product of Vectors.

6	Line and Plane	- Vector and Cartesian equations of a line.
		  i. Passing through a point and parallel to a vector.
		  ii. Passing through two points. - Distance of a point from a line. - Skew lines
		  i. Distance between skew lines
		  ii. Distance between parallel lines. - Equations of Plane:
		  i. Passing through a point and perpendicular to a vector.
		  ii. Passing through a point and parallel to two vectors.
		  iii. Passing through three non-collinear points.
		  iv. In normal form.
		  v. Passing through the intersection of two planes. - Angle between planes:
		  i. Angle between two planes.
		  ii. Angle between a line and a plane. - Coplanarity of two lines. - Distance of a point from a plane

7	Linear Programming	• Linear Inequations in two variables.
		   i. Convex Sets.
		   ii. Graphical representation of linear inequations in two variables.
		   iii. Graphical solution of linear inequation.
		• Linear Programming Problem (L.P.P.).
		   i. Meaning of Linear Programming Problem.
		   ii. Mathematical formulation of L.P. P.
		   iii. Solution of L. P. P. by graphical methods.