Pattern of Entrance Test for B.Sc. Mathematics 4-Year Programme (Budgeted and SFS)

Name of the course	Syllabi	No. of Questions
B.Sc. Mathematics 4-Year (Budgeted and SFS)	10+1 and 10+2 Level of CBSE/ Haryana Board of School Education, Bhiwani	
	a) 10+1 Level	40
	b) 10+2 Level	60

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Head
Department of Mathematics
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Class-11th
Subject: Mathematics

Detailed Syllabus

Chapter No.1

SETS:-

Introduction, Sets and their Representations, The Empty Set, Finite and Infinite Sets, Equal Sets, Subsets, Power Set, Universal Set, Venn Diagrams, Operations on Sets, Union of sets, Intersection of sets, Difference of sets, Complement of a sets, Practical problems on Union and Intersection of two sets.

Chapter No.2

Relations and Functions:-

Introduction, Cartesian Products of sets, Relations Functions, some functions & graphs. Algebra of real function.

Chapter No.3

Trigonometric Function:-

Introduction, Angles, Degree measure, Radian measure, Relation between radian and real numbers, Relation between degree and radian, Trigonometric Functions Signs of Trigonometric Function, Domain and range of Trigonometric Functions.

Trigonometric Function of Sum and Difference of two Angles, Trigonometric Equations.

Chapter No.4

Principle of Mathematical Induction:-

Introduction, Motivation, The Principle of Mathematical Induction.

Chapter No.5

Complex Numbers and Quadratic Equations:-

Introduction, Complex numbers, Algebra of Complex numbers, Addition, Difference, multiplication, division of two Complex numbers, Power of i (iota), The square roots of a negative real number, Identities. The modulus and the conjugate of a complex number, Argand Plane and Polar representation, Quadratic Equations.

Chapter No.6

Linear Inequalities:-

Introduction, Inequalities, Algebric solution of linear Inequalities in one variable and their graphical. Representation, Graphical solution of Linear Inequalities in two variables. Solution of system of Linear Inequalities in two variables.

Chapter No.7

Permutations and Combinations:-

Introduction, Fundamental principle of counting, permutations. Permutations when all the objects are distinct. Factorial notation, Derivation of the formula ${}^{n}Pr$, Permutations when all the objects are not distinct objects, Combinations.

Chapter No.8

Binomial Theorm:-

Introduction, Binomial Theorm for Positive Integral Indices, General and Middle Terms.

Chapter No.9

Sequences and Series:-

Introduction, Sequences, Series, Arithmetic Progression (A.P.), Sum of n-terms of A.P., Arithmetic Mean, Geometrical Progression (G.P.), General term of G.P., Sum of n terms of a G.P., Geometric Mean (G.M.), Relationship between A.M. and G.M.

Sum of n terms of special series.

Chapter No.10

Straight Lines:-

Introduction, slope of a line, slope of a line when co-ordinater of any two points on the line are given, condition for parallelism and perpendicularity of lines in terms of their slopes, Angles between two lines, collinearity of three points, various Forms of the Equation of a

line, Horizontal and Vertical lines, Point slope form, Two-point form, slope intercept form, intercept form, Normal form.

General Equation of a line, Different form of

$Ax+bx+c=0$

Distance of a Point From a Line, Distance between two Parallel lines.

Chapter No.11

Conic Sections:-

Introduction, sections of a Cone, Degenerated Conic sections, Circle, Parabola, Standard equation of Parabola, Lotus rectum, Ellipse, Relationship between semi-major anis semi-minor anis and the distance of focus from the centre of ellipse, special cases of an ellipse, Eccentricity, Standard equations of and ellipse, Lotus rectum, Hyperbola, Eccentricity, Standard equation of Hyperbola Lotus rectum.

Chapter No.12

Introduction to three Dimensional Geometry:-

Introduction, co-ordinate Anes and co-ordinate Planes in three Dimensional space, co-ordinates of a points in space, Distance between two Points, Section Formula.

Chapter No.13

Limits and Derivatives:-

Introduction, Intuitive Idea of Derivatives, Limits Algebra of Limits, Limits of polynomials and rational function, Limits of Trigonometric functions. Derivatives, Algebra of derivative of functions, Derivative of Polynomials and Trigonometric functions.

Chapter No.14

Mathematical Reasoning:-

Introduction, Statements, New Statement from old, Negation of statements Compound statements, Special word/phrases, Quantifiers, Implications, Contra positive and Converse, Validating statements.

Chapter No.15

Statistics:-

Introduction, measures of Dispersion, Range, Mean Deriation, mean deriation for ungrouped data, grouped data, limitations of mean deviation, Variance and standard deviation, standard deviation of a discrete frequency distribution, Standard deviation of a continuous frequency distribution, Shortcut method to find variance and standard deviation, Analysis of Frequency Distributions, Comparision of two frequency distributions with same mean.

Chapter No.16

Probability:-

Introduction, Random Experiments, outcomes and sample space. Event, occurrence of an event, Types of events, Algebra of events, complementary event, The event A or B, The Event A and B, The Event A but not B, Mutually Exclusive events, Exhaustive events.

Axiomatic Approach to Probability. Probability of an events, Probabilities of equally likely outcomes, Probability of the event A or B, Probability of event not A.

Class – XII
Subject- Mathematics
Syllabus

Relations and Functions
Introduction, Types of Relations, Types of Functions, Composition of Functions and Invertible Functions, Binary operations

Inverse Trigonometric Functions
Introduction, Basic Concepts, Properties of Inverse Trigonometric Functions

Matrices
Introductions Matrix, Types of Matrices, Operations on Matrices, Transpose of a Matrix. Symmetric and Skew Symmetric Matrices, Elementary operation (Transformation) of a matrix Invertible Matrix

Determinants
Introduction, Determinant, Properties of Determinants, Area of Triangles, Minors and cofactors. Adjoint and Inverse of a Matrix, Application of Determinants and Matrices.

Continuity and Differentiability
Introduction, Continuity, Differentiability, Exponential and Logarithmic Functions, Logarithmic Differentiation, Derivatives of Functions in Parametric Forms, Second order Derivatives, Mean Value Theorem.

Application of Derivatives
Introductions, Rate of Change of Quantities, Increasing and Decreasing Functions, Tangents and Normals, Approximations, Maxima and Minima

Integrals
Introduction, Integration as an Inverse, Process of Differentiation, Method of Integration, Integrals of Some Particular Functions, Integration by partial fractions, Integration by Parts.

Application of Integrals
Definite Integral, Fundamental theorem of Calculus, Evaluation Definite Integrals by Substitutions, Some Properties of Definite Integrals, Introduction, Area Under simple Curve, Area between Two Curves

Differential Equations
Introduction, Basic Concepts, General and Particular solutions of a Differential Formation of a Differential Equation whose General Solutions is given, Method of solving First order, First degree Differential Equation

Probability
Introduction, Conditional Probability, Multiplication Theorem on Probability, Independent Events, Bayes Theorem, Random Variables and its Probability Distributions, Bernoulli Trials and Binomial Distribution

Vectors
Introduction, Some Basic Concepts, Types of Vectors, Addition of Vectors Multiplication of vector by a scalar, Product of Two vectors

Linear Programming
Introduction, Linear Programming, Problems and its Mathematical Formulation. Different Types of a linear Programming Problems

Three Dimensional Geometry
Introductions, Direction cosines and Direction ratio of a line
Equation of a line in space, Angles between Two lines, Shortest Distance between Two lines, Planes, Co planarity of Two lines, Angle between Two Planes , Distance of a point from a plane, Angle between a line and a plane