MATHEMATICS

Class-XI

BOARD OF SECONDARY EDUCATION, RAJASTHAN
AJMER

Text Book Translation Committee

MATHEMATICS

Class-XI

Convener

Dr. K.G. Bhadana

Associate Professor
S. P. C. Govt. College,
Ajmer

Translators

Dr. Sushil Kumar Bissu

Associate Professor
M. B. D. Govt. College,
Kushalgarh (Banswara)

Dr. P. R. Parihar

Associate Professor
S. P. C. Govt. College,
Ajmer

Syllabus Development Committee

MATHEMATICS

Class-XI

Convener :

Dr. Sushil Kumar Bissu
Associate Professor
Smarat Prthviraj Chouhan Govt. College,
Ajmer

Members :

Rajnarayan Sharma
Retd. Principal
New Sanganer Road, Sodala
Jaipur

Shambhoo Singh Lamba
Principal
Govt. Higher Secondary School,
Topdara, Ajmer

Nagarjun Sharma
Principal
Govt. Higher Secondary School,
Niwai, Tonk

Ramlal Jat
Principal
Govt. Higher Secondary School,
Khadbamniya, Rajsamand

Chandra Prakash Kurmi
Lecturer
Govt. Higher Secondary School,
Todaraisingh, Tonk

Bhagwan Singh Shekawat
Sr. Teacher
Govt. Varishth Upadhyay Sanskrit School,
Pushkar, Ajmer

PREFACE

This book has been translated in accordance with the new syllabus for class XI prescribed by the Board of Secondary Education, Rajasthan, Ajmer. In presenting the book the basic object of the syllabus has been fully kept in mind and an attempt has been made to acquaint the students with the contribution of Indian Mathematician towards the development of scientific traditions. The contribution of Indian Mathematician have been mentioned at appropriate places. Every effort has been made to present the subject in simple and lucid manner Important principal have been explained in detail.

In the interest of the students sufficient number the illustrative examples have been given. At the end of each chapter a summary of the chapter is given in the form of important points, which will help the students in revision. In each chapter objective, short and essay type questions have been given in sufficient number in the miscellaneous exercise.

We hope the book will be useful to students. Students, teachers and reviewers are requested to send their comments, suggestions and to point out any shortcoming in the book, so that the desired improvement in the book can be made in the subsequent edition.

Authors

MATHEMATICS

Time3.15 Hours **Subject code :15**

Max. Marks : 100

Note- The Syllabus of Mathematics for the students of arts, commerce, science and agriculture is the same.

Name of unit	**Marks**
Unit-1 Sets, Relations and functions	**28**
1. Set	08
2. Relations and functions	10
3. Trigonometric functions	10
Unit-2 Algebra	**36**
4. The principle of Mathematical Induction	04
5. Complex numbers	07
6. Permutations and combinations	07
7. Binomial Theorem	06
8. Sequence, progression and series	08
9. Logarithms	04
Unit-3 Calculus	**08**
10. Limits and derivatives	08
Unit-4 Coordinate Geometry	**16**
11. Straight line	07
12. Conic section	09
Unit-5 Statistics	**12**
13. Measures of dispersion	06
14. Probability	06

Details of the Syllabus

Unit-1 Sets, Relations and functions

1. Set - Set and its representation, different type of sets, subset, operations on sets, elementry operations on sets representation by Venn diagram.

2. Relations and functions - Open sentence, ordered pair, cartesian product of two sets, relation, relation in the form of group of ordered pairs, domain and range of the relation, inverse relation, identity relation, types of relations, function, function in the form set of ordered pair, domain, co domain and range of the function, rational function, modules function sign function, maximum integer function, algebra of real functions. Type of functions.

3. Trigonometric function - Angle, sign of trigonometric function, domain and range of trigonometric functions, groups of trigonometric functions, addition and substraction of two angles of trigonometric function, trigonometric equation.

Unit-2 Algebra

4. The principle of Mathematical Induction - The process of proof by induction, the principle of mathematical induction and its simple applications.

5. Complex numbers - Complex numbers, set of complex numbers, theorem on complex numbers, basic operations on the set of complex numbers, properties of conjugate complex numbers, modulus of complex numbers, properties of modulus of complex numbers, geometrical representation of complex numbers. The square root of $a + ib$ of complex numbers. Cube roots of unity. Quadratic equation.

6. Permutations and combinations - Basic principle of product, basic principle of addition, factorial, permutations number of permutations. Permutation of the objects whose all are not in fractions, circular permutations, difference of clockwise and anticlockwise permutations, combinations, properties of ${}^{n}C_{r}$.

7. Binomial Theorems - Binomial theorems for positive integer power ; General terms of the binomial expansion, middle term, coefficient of special power of x^{m}. properties of binomial coefficients. Binomial theorems for rational powers. Some important extensions. Application of Binomial theorems.

8. Sequence, progression and series - Sequence, progression and series, arithmatic series, general term of the series, addition of n^{th} terms of the series. Arithmetic mean, properties of arithmatic series, geometrical series, general terms of the series, geometrical mean, the important properties of arithmetic mean and geometrical mean of two quantities. The sum of first n terms of the geometric series, the sum of infinite geometric series, parallel geometric series. Sum of first n natural numbers and sum of its squares and cubes of the series, the difference method of the sum of series. Harmonic series, general terms, harmonic mean, relation between Arithmetic mean, geometric means and harmonic means.

9. Logarithms - Logarithm, fundamental rule of Logarithm, Logarithm system, relation between Napier Logarithm and ordinary logarithm. Integer and fractions of Logarithm, to find

integer and fractions, Logarithm of any any number. Anti Logarithm.

Unit-3 Calculus

10. Limit and derivatives - Limits, meaning of $x \to a$, Limit of function, theorems on limits, calculation methods of limits, definitions of derivatives, geometrical interpretation of derivatives of derivative function. Algebra of the derivatives of the functions. The derivatives of trigonometric functions.

Unit-4 Coordinate Geometry

11. Straight line - Equation of straight line, (intercepts, slope of straight line) rightangled coordinate, equation of parallel line to the reference axis. Equation of lines in various forms (intercept forms, angle form or tangent form perpendicular form), straight line and linear equation in x - y , conversion of standard forms of general equations of straight lines, line passes through a point, lines passes through two points, the angle between two lines, distance behavear a point and a line, equation of a line which 5 passes through a point and make a angle of the given line.

12. Conic section - Conic section, general equation of a conic section, various forms of a conic section, standard equations and simple properties of circle, parabola, ellipse and hyperbola, intersection of a straight line and given standard forms of a conic, condition of tangency of a straight and normal to the given conic.

Unit-5 Statistics

13. Measure of dispersion - Measure of a dispersion, deviation of qurtile, mean deviations (mean deviation from, mean, median and mode), standard deviation range, coefficient of variance.

14. Probability - Trial, events, results, sample space, algebra of events, mutually events, exclusive events, axioms, probability, the sum and multiplication theorem of additions, the probability of an event at least one happens.

Reference book -

Mathematics : Board of Secondary Education Rajasthan, Ajmer

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