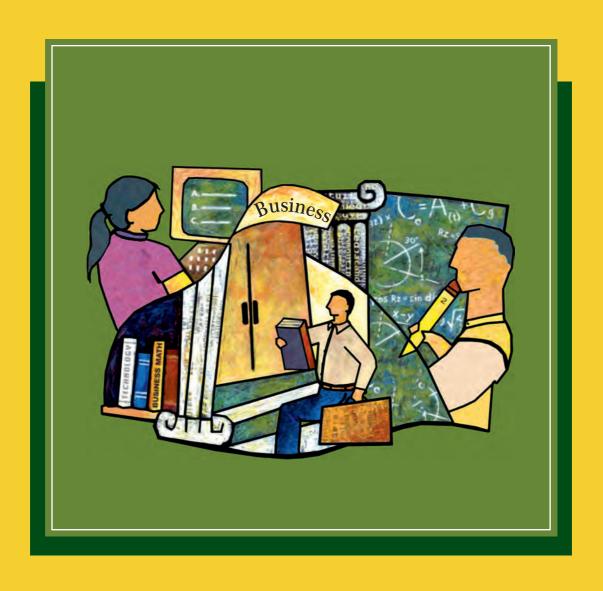# Standard XI

Mathematics & Statistics

Commerce Part 1

The Constitution of India

Chapter IV A

Fundamental Duties

ARTICLE 51A

Fundamental Duties- It shall be the duty of every citizen of India–

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities, to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

(k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

MATHEMATICS
AND
STATISTICS

(COMMERCE)

Part-I

STANDARD XI

2019

N5A6M7

Download DIKSHA App on your smartphone. If you scan the Q.R.Code on this page of your textbook, you will be able to access full text. If you scan the Q.R.Code, you will be able to access audio-visual study material relevant to each lesson, provided as teaching and learning aids.

Commerce Mathematics Paper I Committee Members

Dr. Sharad Gore	(Chairman)
Dr. Mangala Narlikar	(Member)
Smt. Prajakti Gokhale	(Member)
Shri. Prahallad Chippalagatti	(Member)
Shri. Prasad Kunte	(Member)
Shri. Sujit Shinde	(Member)
Shri. Milind Patil	(Member)
Shri. Pradipkumar Bhavsar	(Member)
Shri. Ramakant Sarode	(Member)
Smt. Ujjwala Godbole	(Member-Secretary)

Commerce Mathematics Paper I Study Group Members

Dr. Ishwar Patil	Dr. Pradeep Mugale
Dr. Pradnyankumar Bhojankar	Shri. Devanand Bagul
Shri. Uday Mahindrakar	Shri. Balkrishna Mapari
Shri. Prafullachandra Pawar	Shri. Sachin Batwal
Smt. Nileema Khaladkar	Shri. Swapnil Shinde
Smt. Swati Powar	Smt. Deepti Kharpas
Smt. Mahadevi Mane	Shri. Pramod Deshpande
Shri. Dilip Panchamia	Shri. Vinayak Godbole
Shri. Amit Totade	Smt. Gauri Prachand
Shri. Dhananjay Panhalkar	Smt. Supriya Abhyankar
Shri. Sharadchandra Walagade	

Cover, Illustrations and Computer Drawings

Shri. Sandip Koli, Artist, Mumbai

Co-ordinator

Ujjwala Shrikant Godbole
I/C Special Officer for Mathematics

Typesetter

Baladev Computers, Mumbai

Production

Sachchitanand Aphale
Chief Production Officer

Sanjay Kamble
Production Officer

Prashant Harne
Asst. Production Officer

Paper

70 GSM Cream wove

Print Order No.
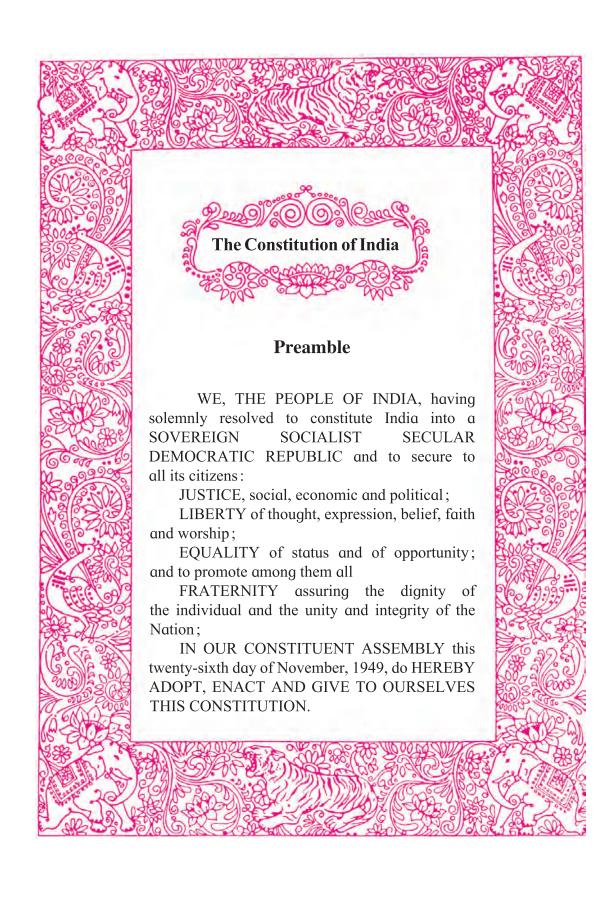
N/PB/2021-22/20,000

Printer

SHRIPAD VALLABHA MUDRANALAYA, KOLHAPUR

Publisher

Vivek Uttam Gosavi, Controller
Maharashtra State Textbook Bureau, Prabhadevi Mumbai- 400 025

The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens :

JUSTICE, social, economic and political ;

LIBERTY of thought, expression, belief, faith and worship ;

EQUALITY of status and of opportunity ; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation ;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
    Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
    Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
    uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
    gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
    Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
    Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

PREFACE

Dear Students,

Welcome to the eleventh standard!

You have successfully completed your secondary education and have entered the higher secondary level. You will now need to learn certain mathematical concepts and acquire some statistical skills to add accuracy and precision to your work. Maharashtra State Bureau of Text Book Production and Curriculum Research has modified and restructured the curriculum in Mathematics and Statistics for the Commerce stream in accordance with changing needs of the society.

The curriculum of Mathematics and Statistics is divided in two parts. Part-1 covers topics in Algebra, Co-ordinate Geometry, Complex Numbers, Sets and Relations. Functions and Calculus. Part-2 covers Combinatorics and Statistics. There is a special emphasis on applications. Activities are added at the end of chapters for creative thinking. Some material will be made available on E-balbharati website (ebalbharati.in). It contains a list of specimen practical problems on each chapter. Students should complete the practical exercises under the guidance of their teachers. Journals are to be maintained by students and assessed by teachers.

You are encouraged to use modern technology in your studies. Explore the Internet for more recent information on topics in the curriculum. Get more examples and practice-problems from the Internet. You will enjoy learning if you follow three simple principles: a thorough study of the textbook, learning based on activities, and continuous practice of solving problems.

On the title page Q.R. code is given. It will help you to get more knowledge and clarity about the contents.

This textbook is prepared by mathematics subject commitee and study group. This book has also been reviewed by senior teachers and eminent scholars. The Bureau would like to thank all of them for their contribution in the form of creative writing, constructive criticism, and valuable suggestions in making this book useful. Also the Bureau is grateful to members of the mathematics subject commitee, study group and reviewers for sparing their valuable time in preparing this book. The Bureau hopes that the textbook will be received well by all users in the right spirit.

You are now ready to study. Best wishes for a happy learning experience.

Pune
Date : 20 June 2019
Indian Solar Date : 30 Jyeshtha 1941

(Dr. Sunil Magar)
Director
Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.

XI Mathematics Commerce Part I
Competency statements

Sr. No	Area	Topic	Competency Statements
1	Sets and Relations	Sets	The student will be able to • work with sets and set functions. • construct sets from given conditions/description/rule. • solve problems using set theory.
		Relations	• identify the types of relations. • use relations to associate different sets. • verify equality, equivalence or other relationships between given sets.
2	Functions	Functions	• work with function defined on different domains. • identify different types of functions. • carry out complicated operations on functions.
3	Complex Numbers	Complex Numbers	• simplify algebraic expressions involving complex numbers.
4	Sequence and series	Sequence	• identify the type of a given sequence. • find the general term of given sequence.
		Series	• identify the type of a given series • find the nth term of a given series • find the sum of the first n terms of a given series • find the sum to infinite terms of a given series
5	Locus and Straight Line	Locus and Straight Line	• find equation of a straight line satisfying given conditions • identify properties of given set of straight lines
6	Determinants	Determinants	• find value of a determinant. • simplify determinant. • solve linear equations in 2/3 variables, find area of triangle using determinants.
7	Limits	Limits	• find limit of a function • determine whether a given function has a limit
8	Continuity	Continuity	• determine whether a given function is continuous at a given point • determine whether a given function is continuous over a specified interval • identify points of discontinuity of a given function
9	Differentiation	Differentiation	• differentiate algebraic functions

INDEX