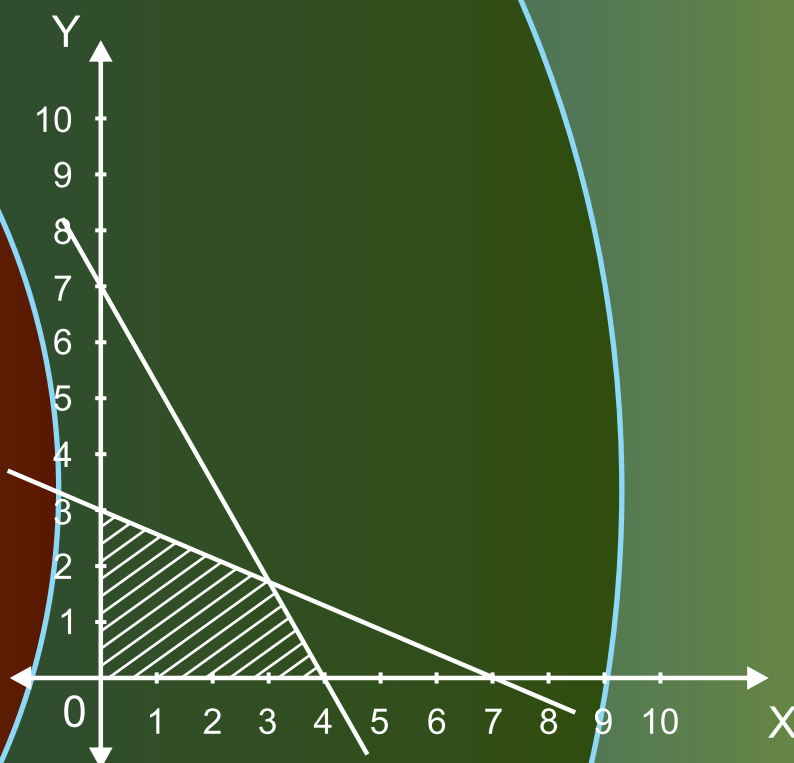
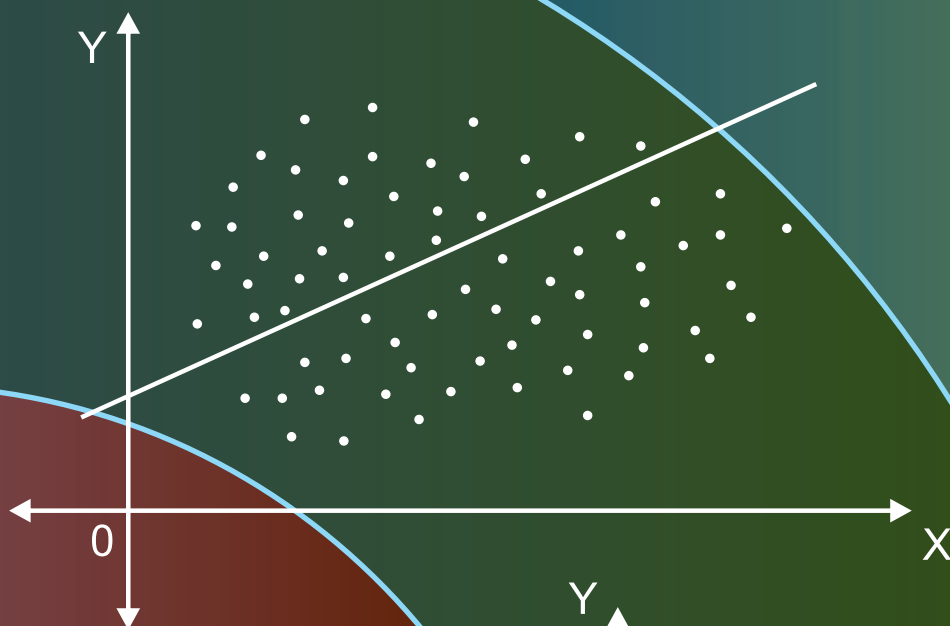


STANDARD XII



Mathematics & Statistics

Commerce Part 2



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.

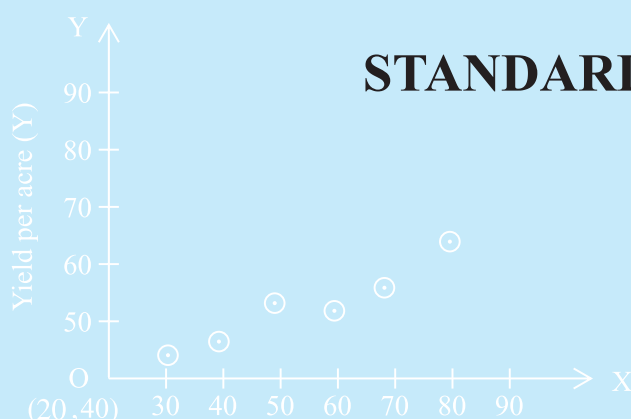
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Mathematics and Statistics

(Commerce)

Part - II

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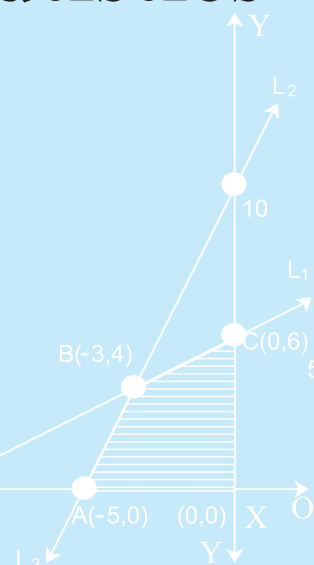


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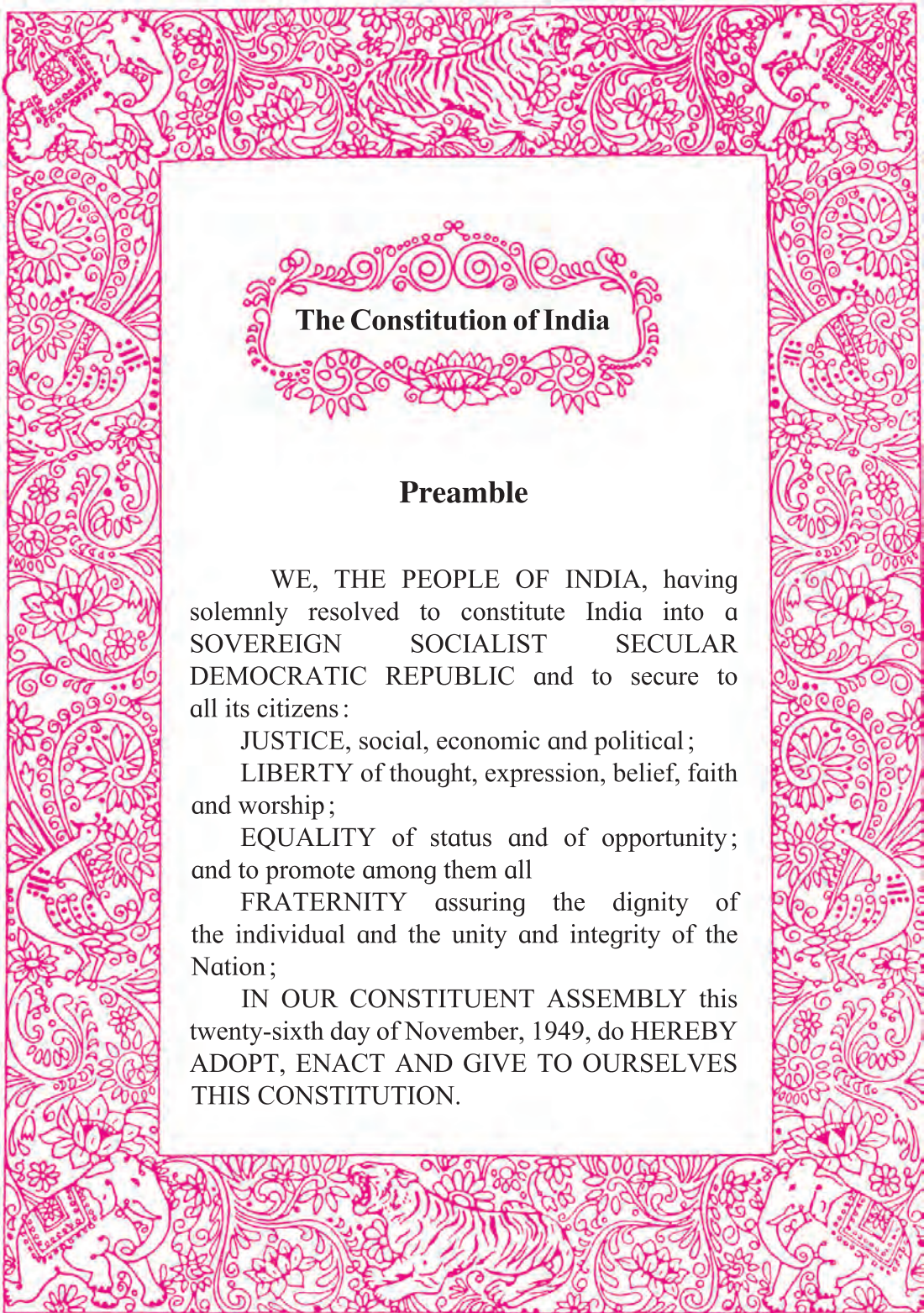
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The Constitution of India

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 Standard XII, an important milestone in your student life.

Standard XII or Higher Secondary Certificate opens the doors of higher education. After successfully completing the higher secondary education, you can pursue higher education for acquiring knowledge and qualification. Alternatively, you can pursue other career paths like joining the workforce. Either way, you will find that mathematics education helps you every day. Learning mathematics enables you to think logically, consistently, and rationally. The curriculum for Standard XII Commerce Mathematics and Statistics has been designed and developed keeping both of these possibilities in mind.

The curriculum of Mathematics and Statistics for Standard XII Commerce is divided in two parts. Part I deals with more theoretical topics like Mathematical Logic, Differentiation and Integration. Part II deals with application oriented topics in finance and management. Random Variables and Probability Distributions are introduced so that you will understand how uncertainty can be handled with the help of probability distributions.

The new text books have three types of exercises for focused and comprehensive practice. First, there are exercises on every important topic. Second, there are comprehensive exercises at end of all chapters. Third, every chapter includes activities that students must attempt after discussion with classmates and teachers. Textbooks cannot provide all the information that the student can find useful. Additional information has been provided on the E-balbharati website (www.ebalbharati.in).

We are living in the age of the Internet. You can make use of the modern technology with help of the Q.R. code given on the title page. The Q.R. code will take you to websites that provide additional useful information. Your learning will be fruitful if you balance between reading the text books and solving exercises. Solving more problems will make you more confident and efficient.

The text books are prepared by a subject committee and a study group. The books are reviewed by experienced teachers and eminent scholars. The Bureau would like to thank all of them for their valuable contribution in the form of creative writing, constructive criticism and useful suggestions for making the text books valuable. The Bureau is grateful to the members of the subject committee, study group and review committee for sparing their valuable time while preparing these text books. The Bureau hopes and wishes that the text books are appreciated and well received by students, teachers and parents.

Students, you are now ready to study. All the best wishes for a happy learning experience and a well deserved success. Enjoy learning and you will succeed.

Pune

Date : 21 February 2020

Bharatiya Saur : 2 Phalgun 1941



(Vivek Gosavi)

Director

Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.

Competency statements

Sr. No.	Area / Topic	Competency Statement
1	Commission, Brokerage, Discount	- understand terms like Agent, Commission Agent, Broker, Auctioneer, Factor, Del credere Agent - identify trade discount and cash discount - know meaning and formula of present worth, true discount, sum due, date of bill, face value, period, nominal due date, discount, banker's gain - solve problems on commission and brokerage
2	Insurance	- understand the terms premium, policy value, types of insurance (fire, marine and accident) - know rules and formulae for claims
	Annuity	- identify types of annuity - know terms related to annuity - understand annuity formulae including abbreviations used in them - solve annuity problems
3	Linear Regression	- understand the meaning of regression - understand types of regression - understand meaning of linear regression - find the regression coefficient - state the equations of regression lines - state interrelations between standard deviations, regression coefficients and correlation coefficient - remember the properties of regression coefficients - solve problems based on regression
4	Time Series	- understand the concept of a time series - identify the components of a time series - use graphical method to find the trend line for a time series - use moving averages to find the trend line for a time series - use least squares method to find the trend line for a time series
5	Index Numbers	- understand the concept of index numbers - identify types of index numbers - understand the terminology of index number - construct different index numbers - solve economic problems involving index numbers

6	Linear Programming	• understand the concept of linear programming • understand the general form and meaning of LPP • formulate a given problems as LPP • draw constraint lines and find the region of feasible solutions • obtain the optimal solution of LPP
7	Assignment	• understand the assignment problem • formulate an assignment problem • solve an assignment problem by Hungarian method • identify the special cases of assignment problem
	Sequencing	• understand the concept of job sequencing • solve problems of processing n jobs through two machines • solve problem of processing n job through three machine
8	Probability Distribution	• understand the meaning of random variables and types of random variables • understand probability mass function and its properties • understand the cumulative distribution function and its properties • find the expected value and variance of a discrete random variable • understand the probability density function and its properties • find the cumulative distribution function, expected value and variance of continous random variables
	Binomial Distribution	• understand Bernauli trial, Bernouli distribution, condition for Binomial distribution and their properties • use Binomial distribution to calculate required probabilities
	Poisson Distribution	• understand the Poission distribution and its properties • use Poisson distribution to calculate required probabilities

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