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## Department of Electronics

### BOOKS PUBLICATIONS

Sr. No.	Name of Author	Book Title	Publisher
1	Dr. S. M. Ghatole	B.Sc. I Sem-II (Electronics)	G. L. Publisher
2	Dr. S. M. Ghatole	Basic Analog and Digital Electronics (2020)	Pragati Edition
3	Dr. M. J. Hedau	Analog & Linear Integrated Circuits	Das Ganu Prakashan
4	Dr. M. J. Hedau	Basic Communication, Analogue and Digital Circuits	Das Ganu Prakashan
5	Dr. M. J. Hedau	Basic Electronics for Graduate Students	Das Ganu Prakashan
6	Dr. M. J. Hedau	Modern Communication System & Introduction to Microprocessor	Das Ganu Prakashan
7	Dr. M. J. Hedau	Semiconductor Devices and Advanced Digital Electronics	Das Ganu Prakashan
8	Dr. J. K. Keche	Information Communication Technology subject of 9 <sup>th</sup> standard.	Maharashtra State Board, Pune
9	Dr. J. K. Keche	Information Communication Technology subject of 10 <sup>th</sup> standard.	Maharashtra State Board, Pune
10	Dr. J. K. Keche	Information Technology subject of 11 <sup>th</sup> standard for Science, Arts and Commerce stream.	Maharashtra State Board, Pune
11	Dr. J. K. Keche	Information Technology subject of 12 <sup>th</sup> standard for Science, Arts and Commerce stream	Maharashtra State Board, Pune
12	Dr. J. K. Keche	DEEP LEARNING – A MODERN APPROACH	(AG Publishing House) Bhopal, M.P. India ISBN: 978-81-19338-32-0
13	Dr. J. K. Keche	DESKTOP PUBLISHING (Page Maker 6.5 & Corel Draw) As per NEP-2020	AJAY Educational Series Alliance & Co. ISBN: 978-93-91322-92-2
14	Dr. J. K. Keche	OFFICE AUTOMATION As per NEP-2020	Himalaya Publishing House ISBN: 978-93-5840-9
15	Dr. J. K. Keche	Research Methodology- Techniques and Tools (First Edition)	(AG Publishing House) Bhopal, M.P. India ISBN: 978-81-977476-1-8

  
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**(Semester - II)**

# **ELECTRONICS**

**(Paper - I & II)**



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**Prof. Suresh M. Ghatole**  
**Mr. Pravin M. Sontakke**





# Basic Analog and Digital Electronics (For Beginners)

- Suresh M. Ghatole
- Pradeep B. Dahikar

Vol. I

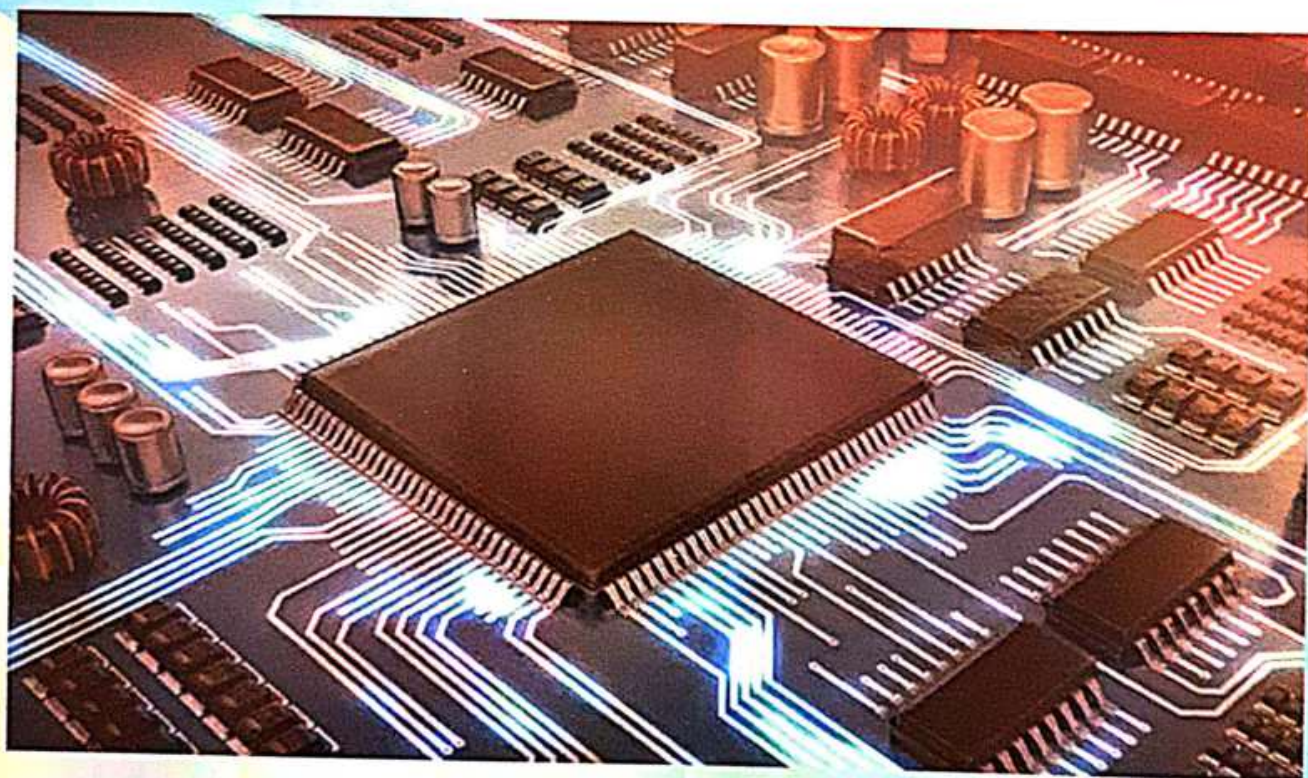


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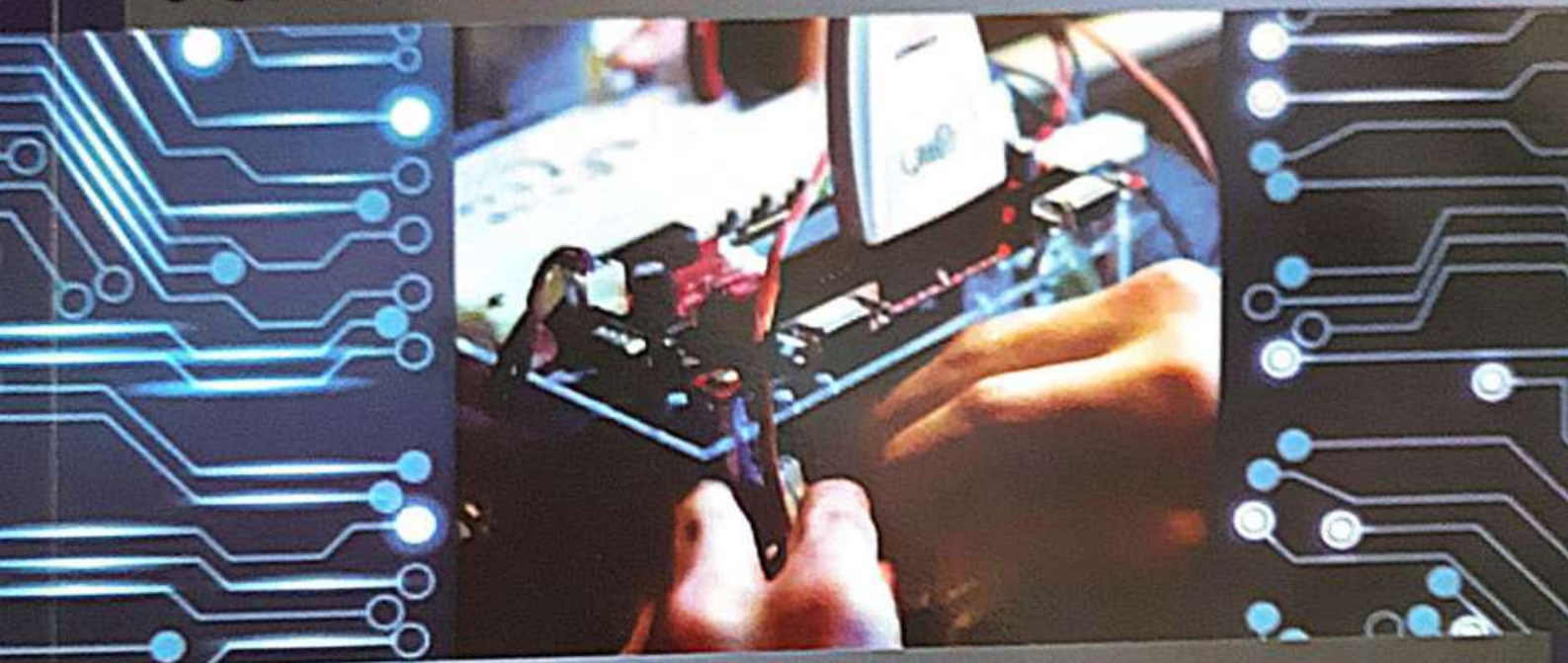


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## About The Book

Deep learning is a popular topic these days since it is a high-level machine learning approach that combines a class of learning algorithms with the application of multiple layers of nonlinear units. A subfield of machine learning, deep learning focuses on powerful algorithms inspired by the structure and function of the human brain called neural networks. A unified geometric analysis to understand the working mechanism of deep learning from high-dimensional geometry is offered. Then, different forms of generative models like GAN, VAE, normalizing flows, optimal transport, and so on are described from a unified geometric perspective, showing that they actually come from statistical distance-minimization problems. This textbook provides a clear and interesting introduction to deep learning, covering a variety of connectionist models that are considered state-of-the-art at the moment. Using a clear and comprehensible writing style, the work examines today's most well-liked algorithms and architectures while also providing a thorough breakdown of their underlying mathematical foundations. Convolutional networks, long short-term memories, word2vec, random bit networks, decision-based networks, neural turing machines, memory networks, autoencoders, and more are all discussed.

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## ABOUT THE AUTHOR'S



**Dr. S. Vincent De Paul**, the former Principal of District Institute of Education and Training (DIET) in Tiruchirappalli, Tamil Nadu, India, holds two doctoral degrees, one in Chemistry and another in Educational Technology. With a distinguished career spanning teaching and administrative roles, he has served in various capacities like Postgraduate Teacher, Head and Senior Lecturer, Reader at SCERT in Chennai, and Principal of DIET. Dr. S. Vincent De Paul has organized national conferences and district-level seminars to enhance teacher and school education. He has conducted Continuous Professional Development Programs for educators, teachers and played key roles in committees focusing on curriculum and examination reforms. He has been involved in various national level projects and has mentored research scholars, with several earning M.Phil and Ph.D. degrees under his guidance. Dr. S. Vincent De Paul has received National Awards for his contributions to teacher education. Dr. S. Vincent De Paul had acted as a Honorary Editorial Board member of the International Journal 'Global Peace'. In addition to authoring several books and chapters, his first book, "Joe-Chemistry Practical Guide," is aimed at higher secondary students. He has served as one of the authors of the text book 'Chemistry for Class X' and a reviewer for the Source Book "Teaching of Science for Diploma in Teacher Education He has translated "The Philosophy of Ahimsa" into Tamil and contributed a chapter to "Peace Philosophy in Action," published by Palgrave Macmillan. Recently, he wrote a chapter titled "Emotion Regulation through Cognitive Strategies" for the book "Emotion Regulation - Theory and Applications to Therapy Across Clinical Settings," soon to be published by IntechOpen. Dr. De Paul is also adept in data analysis using various software, including MS Excel, SPSS, SMART PLS, Jamovi, Power BI, Orange, and NMVIO.



**Prof. Jagadish A N**, has been working as an assistant professor in the Department of Computer Science and Engineering at Babji Institute of Engineering and Technology, Davanagere, Karnataka, India, since February 16, 2008. Previously, he was employed as a junior programmer at SCS Private Limited Company, Bengaluru, for six months and also served as a junior scientist at the Karnataka State Remote Sensing Application Centre (KRSRAC), Bengaluru, for one year. Currently, a Ph.D. is being pursued under the guidance of Dr. Ravi Kumar M at Kuvempu University, Jnanashayadri, Shankarhatta, Shivamogga, Karnataka, India. Fields of interest include machine learning, artificial intelligence, and medical imaging. Hobbies include playing sports and watching thriller movies.



**Dr. S. Nagarajan**, has been working as an Associate Professor & Head at Kongu Arts and Science college (Autonomous), Erode, Tamil Nadu. He has the work experience of more than 27 years. His current area of research is Graph Theory and its Applications. He has guided 3 Ph.D. Scholars and 50 M.Phil. Scholars so far. Currently he is guiding 6 Scholars for Ph.D. He has got 4 Patents including one Australian Patent and published around 35 papers in National and International Journals including SCIE, Scopus & Web of Science. He has reviewed papers in Material Today Proceedings by Elsevier. He has published 4 books & 2 book chapters to his credit.



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**Commerce**

**Standard XI**

Maharashtra State Board of Secondary and  
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## Preface

It is our great pleasure and privilege to present this new textbook of Information Technology for the students of std XI.

This curriculum is based on guidelines of state curriculum framework 2010. Today the use of Technology for processing information has become inherent part of our lives. Information Technology and tools are becoming available to us everyday. It is an attempt to use the technology in education to enrich the teaching and learning process. Maharashtra State Board of Secondary and Higher Secondary Education has decided to prepare a new syllabi of 'Information Technology' for the students studying in std. XI.

The board is happy to state that this syllabi is able to develop the understanding capacity of the students and to acquaint with their dynamic nature.

The content of the book for std. XI has been prepared by the authors under the guidance of the board of studies. The same has been reviewed by experienced teachers and experts in the subject prior to publication. The board would like to thank all of them for their sincere comments, constructive criticism and valuable suggestions. The board is also thankful to board of studies, authors and co-ordinators who have extended their co-operation by sparing their valuable time for the preparation of this textbook.

This board is also thankful to the Maharashtra State Bureau of Textbook Production and Curriculum Research for the co-operation in bringing out this textbook.



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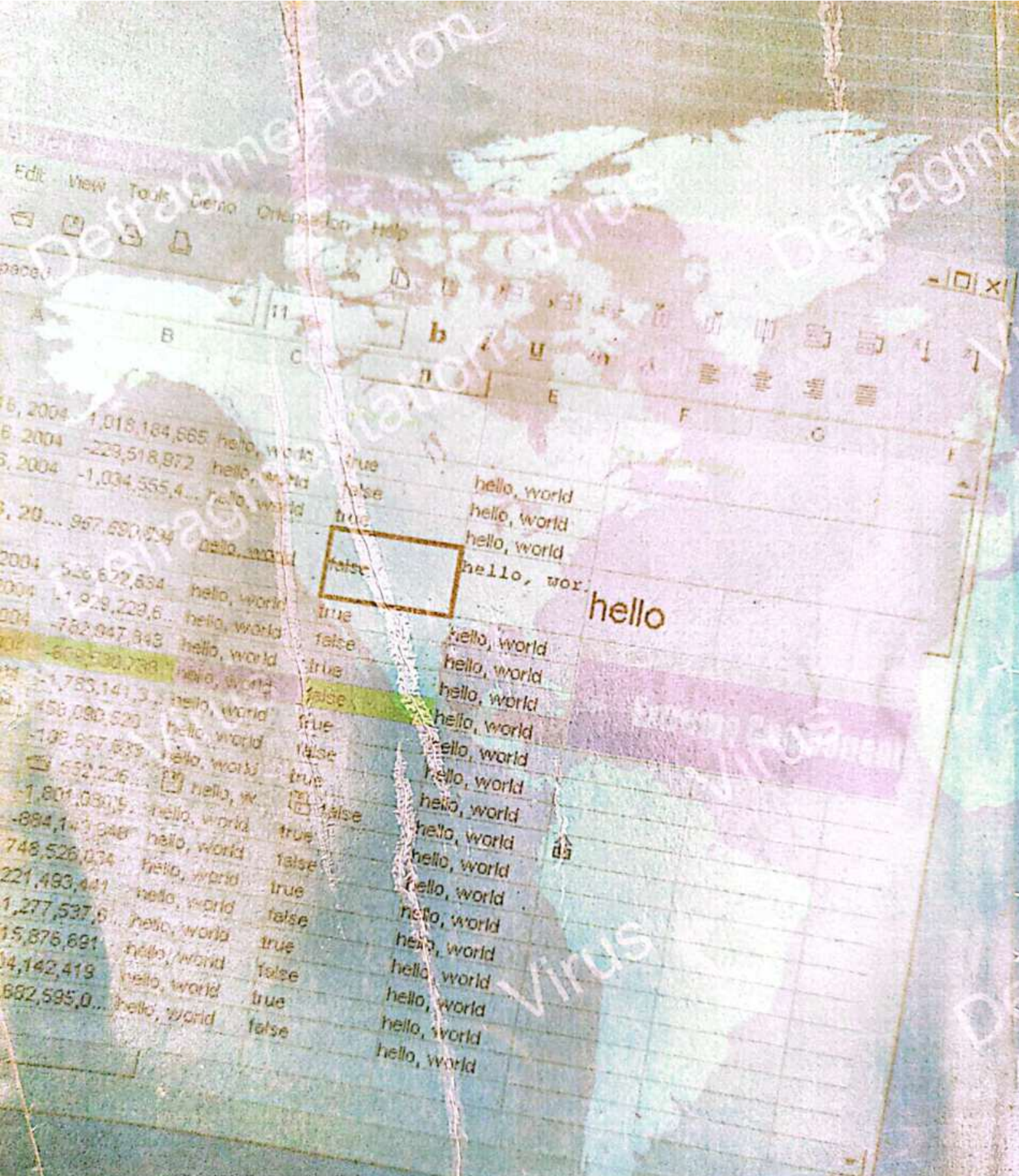
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# INFORMATION COMMUNICATION TECHNOLOGY

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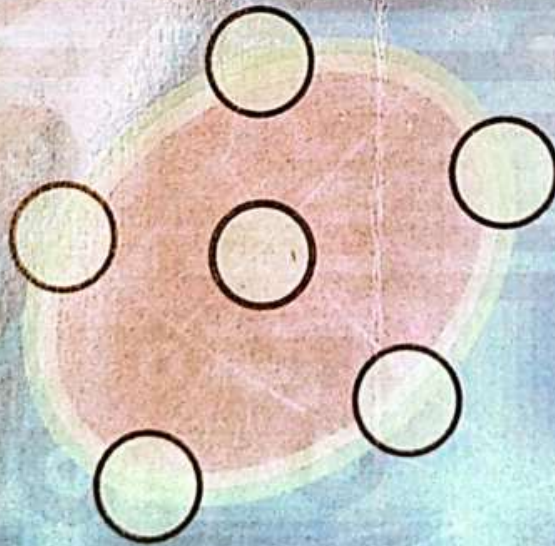
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## Foreword

Today the use of technology for processing information has become inherent part of our lives. With the advances of technology and motivation from the Government to use computers in teacher learning. We have introduced Information Communication Technology (ICT) as a compulsory subject for Standard IX and X.

ICT does not involve the detailed study of computers nor it is the study of computer programming. It is the effective use of available information in its various forms with the help of communication tools and technology. New technology and tools are becoming available to us every day, it is an attempt to use the technology in education to enrich the teaching-learning process.

In these efforts it is necessary to make teachers and students familiar with ICT technology so that they will be empowered to use this technology in teaching learning effectively.

This book provides the knowledge of ICT which includes advantages, potential of ICT, use of ICT in Science, Mathematics and different languages, office automation tools & awareness & use of internet.

The content of the book for Std. X has been prepared by the board of studies and committee of authors under the guidance of the Board of Studies. The same has been reviewed by experienced teachers & experts in the subject prior to publication. The Board would like to thank all of them for their sincere comments, constructive criticism & valuable suggestion. The Board is also grateful to the members of the Board of Studies, authors and co-ordinators who have extended their co-operation by sparing their valuable time for the preparation of this text book.

The Board is also thankful to the Maharashtra State Bureau of Textbook production and Curriculum Research for the co-operation in bringing out their text book.

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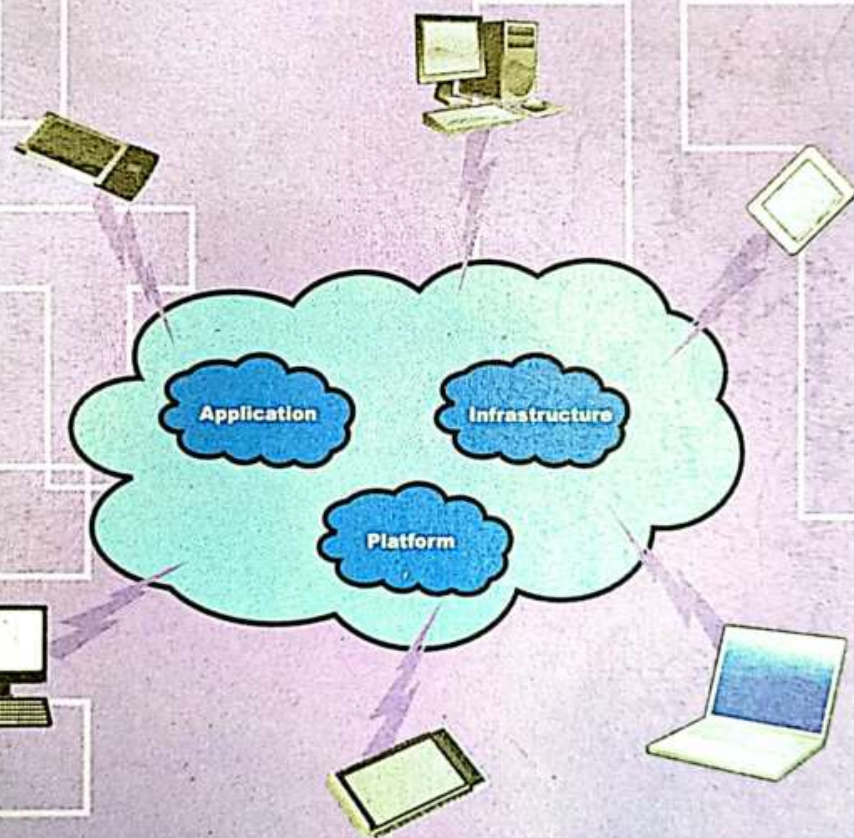


# INFORMATION TECHNOLOGY

SCIENCE

STANDARD XII

*Mr. J. K. Kechhe*



Maharashtra State Board of Secondary and  
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T. K. Keehe

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## PREFACE

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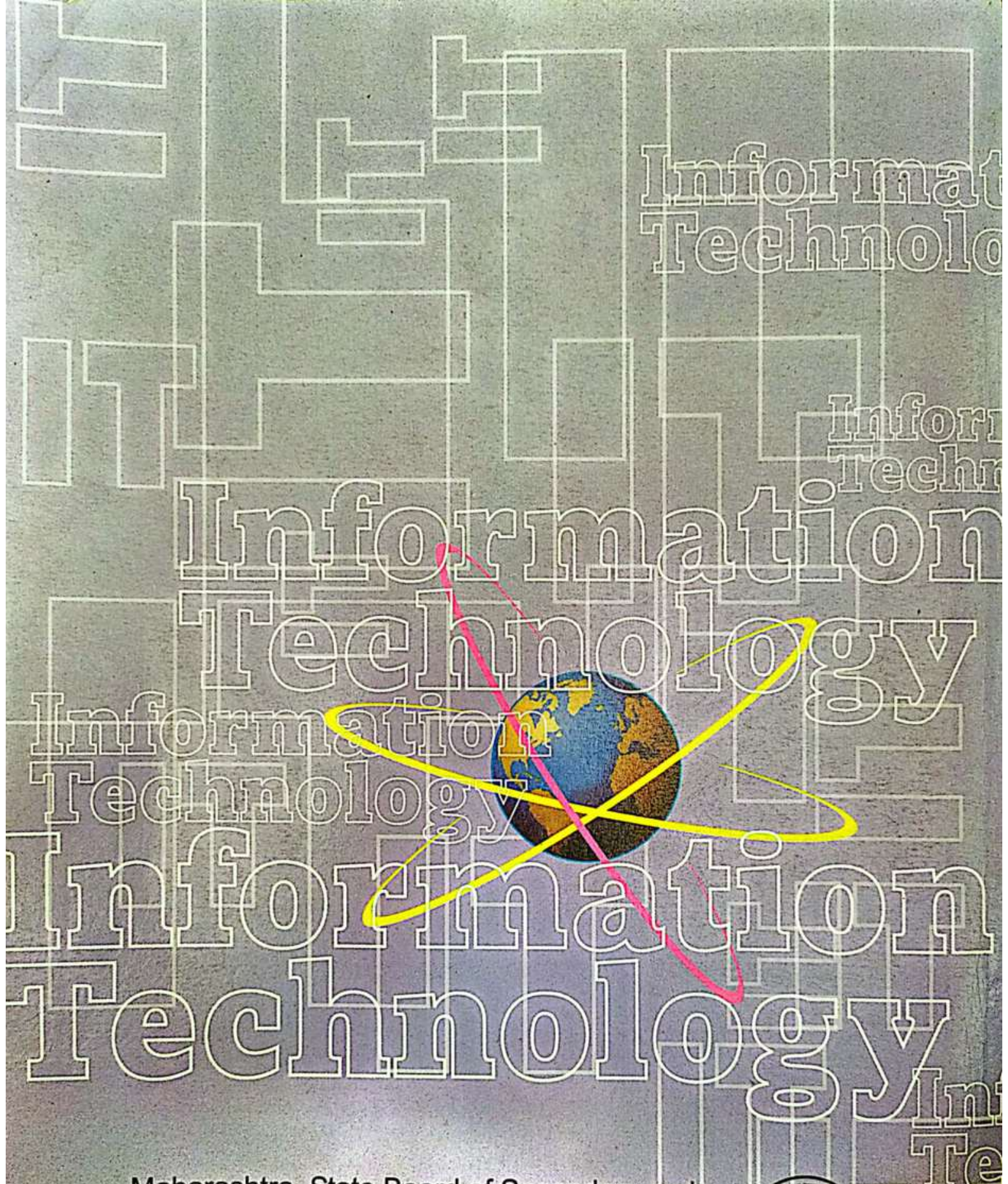


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# माहिती संप्रेषण तंत्रज्ञान (ICT)

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या पुस्तकाच्या कोणत्याही भागाचे, मा.सचिव, महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे - 411 004 यांच्या लेखी परवानगीशिवाय मुद्रण किंवा पुनर्मुद्रण करण्यास मनाई आहे. तसेच सी.डी. दृक्श्राव्य फिती, छायांकित प्रती किंवा अशा प्रकारच्या माहिती साठवून ठेवणाऱ्या कोणत्याही विजेवर चालणाऱ्या अथवा यांत्रिक संदेशवहन पद्धतीचा वापर करता येणार नाही.

प्रस्तुत पुस्तक महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळाच्या धोरणानुसार अभ्यास मंडळ व लेखन मंडळाने अभ्यास मंडळाच्या मार्गदर्शनाखाली तयार केले आहे.

अभ्यास मंडळ सदस्य

: डॉ. शामकांत नरहर कोतकर - निमंत्रक

श्री. उदय विजयकुमार थेटे - सदस्य

श्री. माधव वसंत पळशीकर - सदस्य

श्री. जागेश्वर केशवराव केचे - सदस्य ✓

प्रा. गजानन पंडितराव भेरडे - सदस्य

श्री. सैय्यद हारून - सदस्य

श्रीमती सुषमा शिवगोंडा पाटील - सदस्य

श्रीमती नेहा नितीन कट्टी - सदस्य

श्रीमती अर्चना अतुल राठोड - सदस्य

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श्री भालचंद्र दिगंबर जोशी - सदस्य

श्री ललित श्रेणिक भुरे - सदस्य

श्री जय रामकृष्ण काशिव - सदस्य

लेखक मंडळ सदस्य

: • श्रीमती रुपाली स. ब्रह्मे • श्री. जागेश्वर केचे ✓ • प्रा. गजानन भेरडे  
• श्री. आत्तार शमशुद्दीन एन. • श्री. ललित भुरे • श्री. भालचंद्र जोशी

समन्वयक

: डॉ. सौ. सुलभा नितीन विधाते  
सौ. नेहा नितीन कट्टी

मराठी अनुवादक

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संयोजक व संपर्क  
अधिकारी

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निर्मिती व वितरण

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मुखपृष्ठ चित्रकार

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अक्षर जुळणी

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कागद

: 70 जी.एस्.एम्. क्रीमोन्ह

मुद्रक

: कॉम्प-प्रिंट कल्पना प्रा. लि.

मुद्रणादेश

: N.P.B. 2013-14 (50,000)



## मनीगत

आधुनिक तंत्रज्ञानाचा वापर करणे ही आजच्या जीवनाची गरज झाली आहे. तंत्रज्ञानाचे फायदे व शासनाची प्रेरणा यामुळे आम्ही इयत्ता 9 वी व 10 वी साठी 'माहिती संप्रेषण तंत्रज्ञान' (ICT) हा अनिवार्य विषय म्हणून अंतर्भूत करत आहोत.

ICT या विषयात फक्त संगणकाचा अभ्यास नाही तर संगणक प्रणालींचाही समावेश आहे. संप्रेषणाची साधने व तंत्रे वापरून उपलब्ध माहिती परिणामकारकरित्या सांगू शकतो, ही साधने व तंत्रे सहजरित्या दैनंदिन जीवनात उपलब्ध असल्याने शिक्षणक्षेत्रातील अध्ययन, अध्यापन प्रक्रिया या माध्यमातून समृद्ध करण्याचा हा एक प्रयास आहे.

सर्व विद्यार्थी व शिक्षक या तंत्रज्ञानाच्या वापरात पारंगत होणे आवश्यक आहे. या पुस्तकात माहिती संप्रेषण तंत्रज्ञानाचे सामर्थ्य, इंटरनेट ॲप्लीकेशन, विज्ञान, गणित, मॉडेलिंग आणि सिम्युलेशनमध्ये माहिती तंत्रज्ञान, दैनंदिन जीवनात आय.सी.टी. भारतीय भाषांची माहिती तसेच गणिती सॉफ्टवेअर जिओजेब्रा या विषयांचा समावेश आहे

हे पाठ्यपुस्तक अभ्यासमंडळ व लेखन मंडळाने अभ्यासमंडळ सदस्यांच्या मार्गदर्शनाखाली लेखक मंडळींनी लिहिले आहे. प्रकाशनापूर्वी अनुभवी शिक्षक व तज्ज्ञ यांच्या मार्गदर्शनाखाली या पुस्तकाचे समीक्षण झाले आहे. समीक्षकांच्या प्रामाणिक सूचना, विधायक चिकित्सा व मौलिक सूचनांबद्दल अभ्यासमंडळ सदस्य आभारी आहेत.

हे पाठ्यपुस्तक अनेक तज्ज्ञ मंडळींच्या सहभागातून तयार झाले आहे. माहिती संप्रेषण तंत्रज्ञान विषयाचे अभ्यासमंडळ सदस्य, लेखकमंडळ सदस्य आणि समन्वयक या सर्वांच्या बहुमोल वेळातून व परिश्रमातून हे पाठ्यपुस्तक साकारले आहे.

महाराष्ट्र राज्य पाठ्यपुस्तक निर्मिती व अभ्यासक्रम संशोधन मंडळाने हे पुस्तक आकर्षक रूपात मुद्रित करण्यासाठी विशेष परिश्रम घेतले आहेत. या सर्वांच्या सहकार्याबद्दल राज्य मंडळ त्यांचे आभारी आहे.



(सर्जेराव जाधव)

चेअरमन

महाराष्ट्र राज्य माध्यमिक व  
उच्च माध्यमिक शिक्षण मंडळ  
पुणे- 411004.

पुणे- 411 004.

दिनांक : 8.3.2013

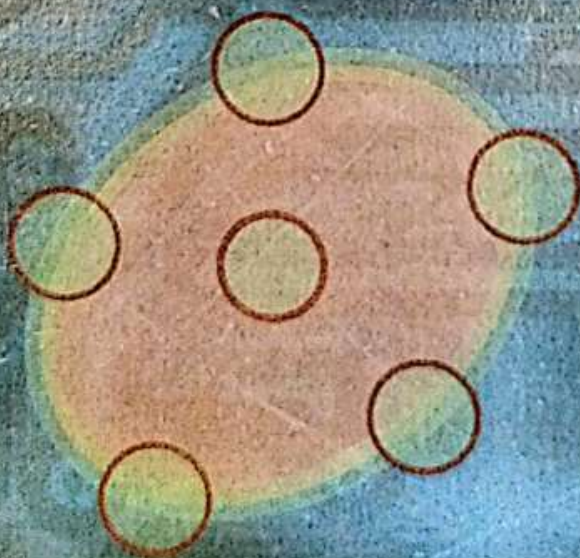


## अनुक्रमणिका

प्रकरण क्रमांक	प्रकरणाचे नाव	पृष्ठ क्र.
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महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे - 411 004

₹ 29.00

