

Code: CT22
Time: 3 Hours

Subject: DISCRETE MATHEMATICAL STRUCTURES

Max. Marks: 100

MARCH 2011

NOTE:

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
- Parts of a question should be answered at the same place.

- Q.1**
- a. Prove that $p \rightarrow (q \rightarrow r)$ and $(p \wedge \neg r) \rightarrow \neg q$ are logically equivalent.
 - b. In a survey, 2000 people were asked whether they read 'India Today' or 'Business Times'. It was found that 1200 read 'India Today', 900 read 'Business Times' and 400 read both. Find how many read at least one magazine and how many read neither.
 - c. What is the minimum number of students required in a class to be sure that at least 6 will receive the same grade if there are five possible grades A, B, C, D and F?
 - d. Determine whether the following is a valid argument:
I am happy if my program runs. A necessary condition for the program to run is it should be error free. I am not happy. Therefore the program is not error free.
 - e. Let m be a positive integer with $m > 1$. Determine whether or not the following relation is an equivalent relation: $R = \{(a, b) \mid a \equiv b \pmod{m}\}$
 - f. Define Euler path, Euler circuit, Hamiltonian path and Hamiltonian circuit.
 - g. Design a DFA for recognizing identifiers, unsigned integers and unsigned real numbers with fractions. (7 × 4)
- Q.2**
- a. Consider the set $A = \{2, 7, 14, 28, 56, 84\}$ and the relation $a \leq b$ if and only if a divides b . Give the Hasse diagram for the poset (A, \leq) .
 - b. Let L be a distributive lattice. Show that
if $a \wedge x = a \wedge y$ and $a \vee x = a \vee y$, then $x = y$ for same a . (9+9)
- Q.3**
- a. Translate the following into logical notation. Let the universe of discourse be the real numbers.
 - (i) For any value of x , x^2 is non negative.
 - (ii) For every value of x , there is some value of y such that $x, y = 1$.
 - (iii) There are positive values of x and y such that $x, y > 0$
 - (iv) There is a value of x such that if y is positive, then $x+y$ is negative.
 - b. Minimize the following Boolean expression and give its DNF.

$$F(A, B, C, D) = \pi(0, 1, 4, 5, 8, 12, 13, 14, 15)$$

Iete Question Papers

Suhash Chandra Dutta Roy



Iete Question Papers:

Advanced Engineering Mathematics, 22e Dass H.K., 2019 Advanced Engineering Mathematics is written for the students of all engineering disciplines Topics such as Partial Differentiation Differential Equations Complex Numbers Statistics Probability Fuzzy Sets and Linear Programming which are an important part of all major universities have been well explained Filled with examples and in text exercises the book successfully helps the student to practice and retain the understanding of otherwise difficult concepts **IETE Journal of Research**, 2003 *Advanced Engineering Mathematics, 23e (In accordance to the latest AICTE Pattern)* H K Dass, Rajnish Verma & Rama Verma, Advanced Engineering Mathematics is a comprehensive guide to a wide range of mathematical concepts and techniques essential for various fields of study Dive into the rich collages of mathematical concepts from Partial Differentiation to the Simplex Method each chapter meticulously crafted to build your understanding and application skills Whether you are exploring the depths of Differential Equations exploring into the details of Complex Numbers or connecting the power of Numerical Methods this book offers clear explanations practical examples and challenging exercises to support your learning journey Discover how Vector Calculus transforms your approach how Probability and Statistics sharpen your data analysis and how Fourier and Laplace Transformations simplify complex problems Special topics like Chebyshev Polynomials Fuzzy Set theory and Empirical Law offer awareness into revolutionary mathematical applications This book is perfect for anyone passionate about mathematics and will inspire you to solve problems with confidence creativity and accuracy Advanced Engineering Mathematics H K Dass, 2007-12 This book has received very good response from students and teachers within the country and abroad alike Its previous edition exhausted in a very short time I place on record my sense of gratitude to the students and teachers for their appreciation of my work which has offered me an opportunity to bring out this revised Eighteenth Edition Due to the demand of students a chapter on Linear Programming as added A large number of new examples and problems selected from the latest question papers of various engineering examinations held recently have been included to enable the students to understand the latest trend **IETE Technical Review**, 2005 *WAVE PROPAGATION AND ANTENNA ENGINEERING* KUMAR, SANJAY, SHUKLA, SAURABH, 2015-12-14 The book is primarily designed to cater to the needs of undergraduate and postgraduate students of Electronics and Communication Engineering and allied branches It also caters for fundamental requirements of professionals working on design and development of antenna and wave propagation related equipment either in research laboratories or industries or academic institutions elsewhere The book has been written with intent to grasp the basic understanding of theoretical as well as practical aspects of electromagnetic wave propagation and antenna engineering The text has been aptly scripted considering the requirements of average students who can easily grasp and comprehend the basics of wave propagation and radiation mechanism of varieties of antennas coupled with their critical functionalities utilities advantages disadvantages without any external assistance of teachers or other reference books The

book broaches very well on practical methods of parametric measurements of antenna with right measuring test equipment and associated tools The last chapter of the book is dedicated to advance technology adopted in design and development of modern antenna Key features A fairly large number of well labelled diagrams to provide practical understanding of the concepts The placement of numericals at appropriate places develops confidence among readers and enthuses them further to read in depth to crack any regular or competitive examinations Chapter summary highlights important points for quick recap and revision before examination Well crafted multiple choice questions with answers at the end of each chapter to stimulate thought process and prepare better for viva voce and competitive examinations Appropriate number of unsolved numerical problems with answers to improve problem solving skill of students

Data Structures and Algorithms in C++ Lee Wittenberg,2017-05-11 No detailed description available for Data Structures and Algorithms in C *Journal of the Institution of Electronics and Telecommunication Engineers* ,1996

Topics in Signal Processing Suhash Chandra Dutta Roy,2019-10-11 This book is a collection of specific research problems in signal processing and their solutions It touches upon most core topics including active and passive processing discrete time and continuous signals and design of filters and networks for specific applications This unique collection of design problems and conceptual insights will be useful to graduate students researchers and professionals working on signal processing problems In addition the book can also be used as a supplementary text for graduate courses in advanced signal processing and for professional development courses for practicing engineers

Open and Distance Education Santosh Kumar Panda,1999 In the Indian context **IBPS RRB SO Agriculture Officer Scale 2 Exam (English Edition) - 10 Full Length Practice Mock Tests (2400+ MCQs) with Free Access to Online Test Series** EduGorilla Prep Experts,

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Data Structure & Algorithm A Practical Approach Mr. Siddhartha Chatterjee ,Mr. Chiranjib Dutta,Mr. Aniruddha Das,Mr. Nelkantha Dey,2025-02-10 *Parliamentary Papers* Great Britain. Parliament. House of Commons,1956

The Law Times Reports ,1928 **Knowledge Recommendation Systems with Machine Intelligence Algorithms** Jarosław Protasiewicz,2023-09-30 Knowledge recommendation is an timely subject that is encountered frequently in research and information services A compelling and urgent need exists for such systems the modern economy is in dire need of highly skilled professionals researchers and innovators who create opportunities to gain competitive advantage and assist in the management of financial resources and available goods as well

as conducting fundamental and applied research more effectively This book takes readers on a journey into the world of knowledge recommendation and of systems of knowledge recommendation that use machine intelligence algorithms It illustrates knowledge recommendation using two examples The first is the recommendation of reviewers and experts who can evaluate manuscripts of academic articles or of research and development project proposals The second is innovation support which involves bringing science and business together by recommending information that pertains to innovations projects prospective partners experts and conferences meaningfully The book also describes the selection of the algorithms that transform data into information and then into knowledge which is then used in the information systems More specifically recommendation and information extraction algorithms are used to acquire data classify publications identify disambiguate their authors extract keywords evaluate whether enterprises are innovative and recommend knowledge This book comprises original work and is unique in many ways The systems and algorithms it presents are informed by contemporary solutions described in the literature including many compelling novel and original aspects The new and promising directions the book presents as well as the techniques of machine learning applied to knowledge recommendation are all original

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Handbook of Research on Industrial Informatics and Manufacturing Intelligence: Innovations and Solutions Khan, Mohammad Ayoub,Ansari, Abdul Quaiyum,2012-03-31 This book is the best source for the most current relevant cutting edge research in the field of industrial informatics focusing on different methodologies of information technologies to enhance industrial fabrication intelligence and manufacturing processes Provided by publisher

Advances in Information Retrieval Claudia Hauff,Craig Macdonald,Dietmar Jannach,Gabriella Kazai,Franco Maria Nardini,Fabio Pinelli,Fabrizio Silvestri,Nicola Tonellotto,2025-04-03 The five volume set LNCS 15572 15573 15574 15575 and 15576 constitutes the refereed conference proceedings of the 47th European Conference on Information Retrieval ECIR 2025 held in Lucca Italy during April 6 10 2025 The 52 full papers 11 findings 42 short papers and 76 papers of other types presented in these proceedings were carefully reviewed and selected from 530 submissions The accepted papers cover the state of the art in information retrieval and recommender systems user aspects system and foundational aspects artificial intelligence and machine learning applications evaluation new social and technical challenges and other topics of direct or indirect relevance to search and recommendation

Objective Electrical, Electronic and Telecommunication Engineering Theraja B.L. & Pandey V.K.,2009 A Textbook on Electrical Technology

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