

NUMERICAL ANALYSIS AND DIFFERENTIAL  
EQUATIONS

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(For those who joined in January 2011 and after)

Time : Three hours

Maximum : 100 marks

## SECTION A — (4 × 10 = 40 marks)

Answer any FOUR questions.

1. Using Chebyshev method, find the root of the equation  $f(x) = \cos x - xe^x = 0$  correct to six decimal places. Take the initial approximation as  $x_0 = 1.0$ .
2. Solve the system of equations -

$$\begin{bmatrix} 2 & 1 & 1 & -2 \\ 4 & 0 & 2 & 1 \\ 3 & 2 & 2 & 0 \\ 1 & 3 & 2 & -1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ X_4 \end{bmatrix} = \begin{bmatrix} -10 \\ 8 \\ 7 \\ -5 \end{bmatrix}$$

Using the Gauss elimination method with partial pivoting.

3. Calculate the  $n^{\text{th}}$  divided difference of  $\frac{1}{x}$ , based on the points  $x_0, x_1, x_2, \dots, x_n$ .

# Msc Mathematics Model Question Paper

**Marco Casella**



## **Msc Mathematics Model Question Paper:**

**Controlling Epidemics With Mathematical and Machine Learning Models** Varghese, Abraham, Lacap, Jr., Eduardo M., Sajath, Ibrahim, Kumar, M. Kamal, Kolamban, Shajidmon, 2022-10-21 Communicable diseases have been an important part of human history. Epidemics afflicted populations causing many deaths before gradually fading away and emerging again years after. Epidemics of infectious diseases are occurring more often and spreading faster and further than ever in many different regions of the world. The scientific community in addition to its accelerated efforts to develop an effective treatment and vaccination is also playing an important role in advising policymakers on possible non-pharmacological approaches to limit the catastrophic impact of epidemics using mathematical and machine learning models. **Controlling Epidemics With Mathematical and Machine Learning Models** provides mathematical and machine learning models for epidemical diseases with special attention given to the COVID-19 pandemic. It gives mathematical proof of the stability and size of diseases. Covering topics such as compartmental models, reproduction number, and SIR model simulation, this premier reference source is an essential resource for statisticians, government officials, health professionals, epidemiologists, sociologists, students, and educators of higher education, librarians, researchers, and academicians. [Mathematical Modeling](#) Ellis Cumberbatch, Alistair Fitt, 2001-10 This volume presents thirteen different case studies ranging from cooking of cereal to the analysis of epidemic waves in animal populations. **Mathematical Modelling Methodology, Models and Micros** John Stephen Berry, 1986 Proceedings from The Second International Conference on the Teaching of Mathematical Modelling University of Exeter 16-19 July 1985 **Teaching Mathematics Online: Emergent Technologies and Methodologies** Juan, Angel A., Huertas, Maria A., Trenholm, Sven, Steegmann, Cristina, 2011-08-31 This book shares theoretical and applied pedagogical models and systems used in math e-learning including the use of computer-supported collaborative learning which is common to most e-learning practices. Provided by publisher **Teaching and Applying Mathematical Modelling** John Stephen Berry, 1984 **Resources in Education**, 1987 Serves as an index to Eric reports, microform *Scientific and Technical Aerospace Reports*, 1976 **Abstracts of Papers Presented to the American Mathematical Society** American Mathematical Society, 2008 **The M.S.C. Record**, 1916 *Computation for Humanity* Justyna Zander, Pieter Mosterman, 2018-10-03 The exponential progress and accessibility of computing has vastly increased data flows and revolutionized the practice of science, engineering, and communication. Computing plays a critical role in advancing research across almost every scientific discipline. *Computation for Humanity: Information Technology to Advance Society* is a guide for the creation of services, products, and tools that facilitate support and enhance progress of humanity toward more sustainable life. This book provides a deep understanding of the practical applications of computation to solve human-machine problems. Delivers insight into theoretical approaches in an accessible manner. Provides a comprehensive overview of computational science and engineering applications in selected disciplines. Crosses the boundaries between different domains and shows

how they interrelate and complement one another Focuses on grand challenges and issues that matter for the future of humanity Shows different perspectives of computational thinking understanding and reasoning Provides a basis for scientific discoveries and enables adopting scientific theories and engineering practices from other disciplines Takes a step back to provide a human related abstraction level that is not ultimately seen in pure technological elaborations collections The editors provide a collection of numerous computation related projects that form a foundation from which to cross pollinate between different disciplines and further extensive collaboration They present a clear and profound understanding of computing in today s world and provide fundamental solutions to some of the most pertinent humanity related problems

*A History of Elementary Mathematics* Florian Cajori,1898

**A History of Mathematics** Florian Cajori,1893

**Government Reports Announcements** ,1974

**British Universities' Guide to Graduate Study** ,1993

**Government Reports Announcements & Index** ,1986

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