

1 DIFFERENTIAL EQUATIONS

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Differential Equation

- an equation which contains derivatives or differential is called a differential equation

a) $\frac{dy}{dx} + \frac{y}{x} = x^2 - 1$

d) $\frac{\partial z}{\partial t} = z - t \frac{\partial z}{\partial s}$

b) $(s+t) dt - t ds = 0$

e) $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = x^3 y - 2x$

c) $\frac{d^2 y}{dx^2} + 2 \frac{dy}{dx} - 3xy = 0$

f) $xy^2 - 2xy + 3x^4 y - 5 = 0$

Equations a, b and c are ordinary differential equations because they contain only ordinary derivatives or differentials; d and e are partial differential equations because they contain partial derivatives; f is not a differential equation, it is an algebraic equation in x and y.

Order and Degree of a Differential Equation

a) Order of a Differential Equation

- this is the order of the highest derivative that appears in the DE.

examples:

a) $\frac{d^2 y}{dx^2} - 5x \frac{dy}{dx} = 2e^x + 1 \longrightarrow$ second order

b) $x \sin y dx + x^2 \cos y dy = 0 \longrightarrow$ first order

c) $\frac{d^3 y}{dt^3} + t \frac{dy}{dt} = y^2 t - 3 \longrightarrow$ third order

b) Degree of a Differential Equation

If a differential equation can be written as a polynomial in the unknown function and its derivatives, then its degree is the power to which the highest

Differential Equations Notes For Gate

Vančo B. Litovski



Differential Equations Notes For Gate:

Lecture Notes in Analog Electronics Vančo B. Litovski, 2023-01-29 This book discusses larger signal amplifiers denoted as PA Large signal amplifiers are dealing with signals whose magnitude is such that the operation of the active element can no longer be considered linear They are usually designed to get as much power gain and efficiency as possible That is why they are often called power amplifiers In this book two implementations of PA are considered First it is of interest to obtain large signals current or voltage at the output of a cascade of direct coupled amplifiers In this case linearity frequency response and speed are the most important requirements Second are real power amplifiers where the power delivered to the load is of primary interest Of course efficiency linearity and high frequency response are of interest too A very special attention is paid to modern power electronic components such as Power BJT VDMOS IGBT SiC MOS and GaN HEMT DC and switching properties of all these devices are studied in much detail This book also includes a set of appendices which cover solved problems SPICE simulation results for selected set of circuits and a short review of microelectronic technology process

Lecture Notes On Topological Quantum Field Theories And Geometry Of Loop Spaces Laszlo Feher, Andras Stipsicz, Janos Szenthe, 1992-10-09 These lectures introduce some very popular fields in topology The topics discussed are interrelated with modern physics and include works of four leading researchers M Atiyah R Bott J Jones and G Segal The original lectures presented at the conference at Budapest are enlarged with appendices to make these notes self contained

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Physics, Chemistry And Application Of Nanostructures - Reviews And Short Notes To Nanomeeting-2005 Victor E Borisenko, Sergei Vasil'evich Gaponenko, Valerij S Gurin, 2005-04-28 This comprehensive volume presents invited reviews and short notes with exciting new results obtained in fabrication study and application of nanostructures which promise a new generation of electronic and optoelectronic devices The rapid progress in nanoelectronics and optoelectronics molecular electronics and spintronics nanotechnology and quantum processing of information are covered **Elementary Lie Group**

Analysis and Ordinary Differential Equations Nail' Khaïrullovič Ibragimov, 1999-05-04 Lie group analysis based on symmetry and invariance principles is the only systematic method for solving nonlinear differential equations analytically One of Lie's striking achievements was the discovery that the majority of classical devices for integration of special types of ordinary differential equations could be explained and deduced by his theory Moreover this theory provides a universal tool for tackling considerable numbers of differential equations when other means of integration fail This is the first modern text on ordinary differential equations where the basic integration methods are derived from Lie group theory Includes a concise and self contained introduction to differential equations Easy to follow and comprehensive introduction to Lie group analysis The methods described in this book have many applications The author provides students and their teachers with a flexible

text for undergraduate and postgraduate courses spanning a variety of topics from the basic theory through to its many applications The philosophy of Lie groups has become an essential part of the mathematical culture for anyone investigating mathematical models of physical engineering and natural problems

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Bulletin (new Series) of the American Mathematical Society ,1902 **Publishers' circular and booksellers' record** ,1897
Hiroshima Mathematical Journal ,1987 The Publishers' Circular and Booksellers' Record of British and Foreign Literature ,1894
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