NPTEL Video Course - Mathematics - NOC:Mathematical Methods and its Applications

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Co-ordinating Institute - IIT - Roorkee

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to linear differential equations
Lecture 2 - Linear dependence, independence and Wronskian of functions
Lecture 3 - Solution of second-order homogenous linear differential equations with constant coefficients - I
Lecture 4 - Solution of second-order homogenous linear differential equations with constant coefficients - II
Lecture 5 - Method of undetermined coefficients
Lecture 6 - Methods for finding Particular Integral for second-order linear differential equations with const
Lecture 7 - Methods for finding Particular Integral for second-order linear differential equations with const
Lecture 8 - Methods for finding Particular Integral for second-order linear differential equations with const
Lecture 9 - Euler-Cauchy equations
Lecture 10 - Method of reduction for second-order linear differential equations
Lecture 11 - Method of variation of parameters
Lecture 12 - Solution of second order differential equations by changing dependent variable
Lecture 13 - Solution of second order differential equations by changing independent variable
Lecture 14 - Solution of higher-order homogenous linear differential equations with constant coefficients
Lecture 15 - Methods for finding Particular Integral for higher-order linear differential equations
Lecture 16 - Formulation of Partial differential equations
Lecture 17 - Solution of LagrangeÂ s equation - I
Lecture 18 - Solution of LagrangeÂ s equation - II
Lecture 19 - Solution of first order nonlinear equations - I
Lecture 20 - Solution of first order nonlinear equations - II
Lecture 21 - Solution of first order nonlinear equations - III
Lecture 22 - Solution of first order nonlinear equations - IV
Lecture 23 - Introduction to Laplace transforms
Lecture 24 - Laplace transforms of some standard functions
Lecture 25 - Existence theorem for Laplace transforms
Lecture 26 - Properties of Laplace transforms - I
Lecture 27 - Properties of Laplace transforms - II
Lecture 28 - Properties of Laplace transforms - III
Lecture 29 - Properties of Laplace transforms - IV

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Lecture 30 - Convolution theorem for Laplace transforms - I
Lecture 31 - Convolution theorem for Laplace transforms - II
Lecture 32 - Initial and final value theorems for Laplace transforms
Lecture 33 - Laplace transforms of periodic functions
Lecture 34 - Laplace transforms of Heaviside unit step function
Lecture 35 - Laplace transforms of Dirac delta function
Lecture 36 - Applications of Laplace transforms - I
Lecture 37 - Applications of Laplace transforms - II
Lecture 38 - Applications of Laplace transforms - III
Lecture 39 - ZÂ transform and inverse Z-transform of elementary functions
Lecture 40 - Properties of Z-transforms - I
Lecture 41 - Properties of Z-transforms - II
Lecture 42 - Initial and final value theorem for Z-transforms
Lecture 43 - Convolution theorem for Z-transforms
Lecture 44 - Applications of Z-transforms - I
Lecture 45 - Applications of Z-transforms - II
Lecture 46 - Applications of Z-transforms - III
Lecture 47 - Fourier series and its convergence - I
Lecture 48 - Fourier series and its convergence - II
Lecture 49 - Fourier series of even and odd functions
Lecture 50 - Fourier half-range series
Lecture 51 - ParsevelÂ s Identity
Lecture 52 - Complex form of Fourier series
Lecture 53 - Fourier integrals
Lecture 54 - Fourier sine and cosine integrals
Lecture 55 - Fourier transforms
Lecture 56 - Fourier sine and cosine transforms
Lecture 57 - Convolution theorem for Fourier transforms
Lecture 58 - Applications of Fourier transforms to BVP - I
Lecture 59 - Applications of Fourier transforms to BVP - II
Lecture 60 - Applications of Fourier transforms to BVP - III
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