

Dr. B.R.A. Govt. College, Jagdishpura, Kaithal

Name of Assistant professor: Dr. Hansraj Gupta

Class: BA/B.Sc. Subject: Mathematics

1st Sem

Week	Topic
1	Series solution by power series method, Beta & Gamma function. Numericals of Beta & Gamma function
2	Bessel's eqn and its solution. Solutions of Bessel's equation. Bessel's function and their properties. Convergence with numericals. Recurrence Relation generating function. Orthogonality of Bessel function
3	Legendre and Hermite differential equation. Solution with some examples. Properties of Legendre and Hermite function. Recurrence relations and generating function. Orthogonal Legendre functions
4	Rodrigues formulae for Legendre and Hermite function. Laplace integral representation of Legendre polynomials
5	Laplace Transform and its existence. Uniqueness of Laplace Transform. Various Properties of Laplace Transform
6	Laplace Transform of the derivatives. Various numericals for the Laplace Transform
7	Convolution Theorem with numericals. Inverse Laplace Transform. Convolution Theorem
8	Inverse Laplace Transform of derivatives. Some numericals of the inverse Laplace Transform
9	Solution of ordinary differential equation
10	Fourier Transform: with various properties of Fourier Transform. Convolution Theorem
11	Fourier Transform of Derivatives. Relation
12	b/w Laplace and Fourier Transform. Parseval's Identity.
13	Class Test.

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Name of Assistant professor: Dr. Hansraj Gupta

Class: M.Sc. (F) Subject: P.P.E

Week	Topic
1	Definition of P.D.E. Initial value problem. Transport eqn with examples. Homogeneous and non-homogeneous eqn
2	Fundamental solution. Harmonic function and their properties. Mean value formulae.
3	Poisson equation and its solution. Strong maximum principle. Uniqueness. Harmonic functions
4	Green's function and its derivative. Representation formulae using Green's function. Symmetry of Green's function for a half space. Green's function
5	Dirichlet function. Heat eqn with numerical fundamental solution and its integration.
6	Solution of initial value problem
7	Wave equation and its physical interpretation
8	Solution of one d'ta wave equation. Reflection method
9	Kirchhoff formula and Poisson's formula for $n=2,3$
10	Solution of non-homogeneous wave equation
11	Uniqueness of wave equation solution
12	Linear and non-linear first order P.P.E
13	Conservative laws and Riemann's problem with numerical. Representation of solutions
14	Separation of variables. Similarity solution
15	Numericals. Fourier Transform and Laplace Transform
	Class Test

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