Subject : Mathematics

Teacher name : Rashminder Semester 3rd

Name of the Paper : Paper 5

Class: MSc (Mathematics)

November 2020

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| Definition of Integral Equations and their classifications. Eigen values and Eigen functions. Special kinds of Kernel Convolution Integral. The inner or scalar product of two functions. Reduction to a system of algebraic equations. Fredholm alternative, Fredholm theorem, Fredholm alternative theorem, An approximate method. |

December 2020

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| Method of successive approximations, Iterative scheme for Fredholm and Volterrra Integral equations of the second kind. Conditions of uniform convergence and uniqueness of series solution. Some results about the resolvent Kernel. Application of iterative scheme to Volterra integral equations of the second kind. Classical Fredholm’s theory, the method of solution of Fredholm equation, Fredholm’s First theorem, Fredholm’s second theorem, Fredhom’s third theorem. |

January2021

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| Symmetric Kernels, Introduction, Complex Hilbert space. An orthonormal system of functions, Riesz-Fisher theorem, A complete two-Dimensional orthonormal set over the rectangle a ≤ s ≤ b,c ≤ t ≤ d. Fundamental properties of Eigenvalues and Eigenfunctions for symmetric Kernels. Expansion in eigen functions and Bilinear form. Hilbert-Schmidt theorem and some immediate consequences. Definite Kernels and Mercer’s theorem. Solution of a symmetric Integral Equation. Approximation of a general 2 λ -Kernel(Not necessarily symmetric) by a separable Kernel. The operator method in the theory of integral equations. Rayleigh-Ritz method for finding the first eigenvalue.). |

February 2021

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| The Abel Intergral Equation. Inversion formula for singular integral equation with Kernel of the type h(s)-h(t) |