Department of Mathematics
Faculty of Sciences, Jamia Millia Islamia

Value Added Papers in Mathematics (2024-25) Course Structure and Syllabus Under NEP

Semester	Code	Title of the Paper	Credits
III	24MATV201	Difference Equations and Z-transform	2

24MATV201	Difference Equations and Z-transform
Unit-I	Finite Difference Calculus: Finite Differences, Finite Difference Operators; Formation of Difference Equations; Linear Difference Equations with Constant Coefficients; Rules for Finding Complementary Functions and Particular Integrals; Simultaneous Difference Equations with Constant Coefficients; Solution of homogeneous and non-homogeneous difference equations.
Unit-II	Z-Transform, Linearity Properties, Change of Scale Property or Damping Rule, Some Standard Z-Transforms Shifting u_n to the Right, Shifting u_n to the Left, Multiplication by n, Division by n, Initial Value Theorem, Final Value Theorem, Inverse Z-Transform, Convolution Theorem, Solution of Difference Equation by Z-Transform.

Books Recommended

1. N. Subramaniam, K. S. Ramaswami, *Transforms and Partial Differential Equations,* Pearson Education India, 2018.
2. Walter G. Kelley, Allan C. Peterson, *Difference Equations An Introduction with Applications,* Academic Press, 2001.
3. C. B. Gupta, A. K. Malik and V. Kumar, Advanced Mathematics, New Age International (P) Ltd., Publishers, 2009.