

Paper IX: Integral Transforms.

I. Laplace transforms:

Definition and basic properties. Laplace transforms of some common functions, Laplace transforms of the derivatives and the integral of the function, convolution theorem. Inverse Laplace transforms: Application to ordinary linear differential equation of first and second order with constant co-efficient, solving the system of first order simultaneous differential equations.

20 Hrs

II. Fourier Series:

Periodic function, Fourier series of function with period 2π and period $2L$. Half range cosine and sine series, Complex form of Fourier series.

10 Hrs

III. Fourier transforms:

Definition and basic properties. Fourier integrals, Fourier sine and cosine integral, Fourier sine and cosine transforms. Properties of F-Transforms. Convolution theorem for F-Transforms, Parseval's Identity for Fourier Transforms. Relation between Laplace and Fourier Transforms. Fourier transforms of the derivatives of function

12 Hrs

VI. Z -Transforms:

Definition and basic properties. Some standard Z- transforms. Linearity property, Damping Rule, Some Standard Results. Shifting U_n to the right to the left, Multiplication by n . Two basic theorems (Initial Value and Final Value Theorems). Some useful Z-Transforms and Inverse Z-Transforms. Evaluation of inverse Z-Transforms (Power series method). Application to Differential equations.

10 Hrs

NOTE: INTERNAL MARKS 30.

References:

1. Churchill.R.V and Briwn JW: Fourier series and Boundary value problems(McGraw-Hill)
 2. G.Bachman, L. Narili, E. Backenstein, Fourier and Wavelet Analysis, Springer, 2005.
 3. Murry. R. Spiegel: Laplace transforms (schaum's Outline Series)
 4. Laplace transforms by S K Anand (Sarup and Sons New Delhi)
 5. Fourier Transforms by Ian.sneddon (Dover Publications)
 6. Dr.B.S.Grewal: Higher Engineering Mathematics, Khanna Publishers.
-