AMPR01 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

UNIT-1 PARTIAL DIFFERENTIAL EQUATIONS

1.1 Formation of partial differential equations
1.2 Singular integrals
1.3 Solutions of standard types of first order partial differential equations
1.4 Lagrange's linear equation
1.5 Linear partial differential equations of second and higher order with constant coefficients of both homogeneous and non-homogeneous types.

UNIT-2 FOURIER SERIES

2.1 Dirichlet's conditions
2.2 General Fourier series
2.3 Odd and even functions
2.4 Half range sine series- Half range cosine series
2.5 Complex form of Fourier series- Parseval's identity- Harmonic analysis.

UNIT-3 APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

3.1 Classification of PDE
3.2 Method of separation of variables
3.3 Solutions of one dimensional wave equation
3.4 One dimensional equation of heat conduction
3.5 Steady state solution of two dimensional equation of heat conduction (excluding insulated edges).

UNIT-4 FOURIER TRANSFORMS

4.1 Statement of Fourier integral theorem- Fourier transform pair-
4.2 Fourier sine and cosine transforms- Properties- Transforms of simple functions
4.3 Convolution theorem- Parseval's identity.

UNIT-5 Z - TRANSFORMS AND DIFFERENCE EQUATIONS

5.1 Z- Transforms- Elementary properties
5.2 Inverse Z- transform (using partial fraction and residues)
5.3 Convolution theorem- Formation of difference equations-
5.4 Solution of difference equations using Z - transform.

References Books:

1. Bali.N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 7th Edition, Laxmi Publications Pvt Ltd , 2007.
2. Ramana.B.V., "Higher Engineering Mathematics", Tata Mc-Graw Hill Publishing Company Limited, New Delhi, 2008.