

Contents

1	Differential Equations	1
1.1	Introduction	1
1.2	First-order differential equations	4
1.3	Second-order linear differential equations	10
1.4	Series solutions of second-order linear equations	17
2	Integral Transforms	28
2.1	Laplace transform	28
2.2	Inverse Laplace transform	34
2.3	Convolution theorem	37
2.4	Delta function	39
2.5	Fourier transform	43
2.6	Convolution theorem and Parseval relation	49
3	Fourier Series	52
3.1	Periodic functions	52
3.2	Fourier series	53
3.3	Complex form of Fourier series	62
3.4	Convergence of Fourier series	63
3.5	Integration and differentiation of Fourier series	65
3.6	From Fourier series to Fourier transform	67