

TABLE OF CONTENTS

PREFACE xi
ACKNOWLEDGEMENTS xiv
INTRODUCTION xv
CHAPTER 1. PRELIMINARIES ON SPECIAL FUNCTION KERNELS	
1.1. Algebraic kernels.....	1
1.2. Exponential, logarithmic, and trigonometric kernels.....	2
1.3. Chebyshev polynomials	3
1.4. Legendre polynomials and functions.....	4
1.5. Gegenbauer and Jacobi polynomials.....	5
1.6. Laguerre and Hermite polynomials	6
1.7. Bessel functions.....	7
1.8. Kummer's and Whittaker's functions.....	8
1.9. Gauss' hypergeometric function	9
1.10. Generalized hypergeometric and other functions.....	10
1.11. Further integral equations with multivariable kernels	13
CHAPTER 2. BASIC PROPERTIES AND THEOREMS	
2.1. Convolutions and relations among equations.....	15
2.2. The Theorem of Titchmarsh and the uniqueness of solutions	19
2.3. Associated integral transformations	20
2.4. Associated fractional integrals.....	21
2.5. Simple kernel variations.....	24
CHAPTER 3. METHODS AND ILLUSTRATIVE EXAMPLES	
3.1. Rodrigues' formula.....	26
3.2. Resolvent kernel.....	27
3.3. Laplace transformation	29
3.4. Mellin and other transformations.....	42
3.5. Fractional integrals	45
3.6. Mikusiński operators.....	48
3.7. Other methods	53

CHAPTER 4. MISCELLANEOUS RESULTS AND OPEN QUESTIONS

4.1. Some immediate consequences from tables of integral transforms.....	56
4.2. Simplifications of generalized hypergeometric kernels	59
4.3. Confluent hypergeometric functions of several variables	64
4.4. Some open questions	68

CHAPTER 5. EQUATIONS OF THE SECOND AND OTHER KINDS

5.1. General properties of equations of the second kind.....	70
5.2. Algebraic kernels	72
5.3. Exponential, trigonometric, and hyperbolic kernels	73
5.4. Higher transcendental functions	75
5.5. Integro-differential equations	76
5.6. Equations of the third kind	77
5.7. Non-linear equations	79

CHAPTER 6. CONVOLUTIONS OVER OTHER INTERVALS

6.1. Convolution over (x, ∞)	81
6.2. Equations on the interval (x, ∞)	84
6.3. Equations on the interval $(0, \infty)$	86
6.4. Equations on the interval $(-\infty, +\infty)$	100
6.5. Equations on the interval $[a, b]$	101

APPENDIX. LIST OF SYMBOLS.....104**INVERSION TABLES. INDEX**.....114

TABLE 1. $\int_0^x k(x-t)f(t)dt = g(x)$	116
TABLE 2. $g(x) + \int_0^x k(x-t)f(t)dt = f(x)$	158
TABLE 3. $\int_x^\infty k(t-x)f(t)dt = g(x)$	167
TABLE 4. $\int_0^x k(x/t)f(t)dt = g(x)$	172
TABLE 5. The forms $\int_0^\infty k(xt)f(t)dt$ and $\int_0^\infty t^{-1}k(x/t)f(t)dt$	180
TABLE 6. The form $\int_0^\infty k(x-t)f(t)dt$	187
TABLE 7. The form $\int_{-\infty}^{+\infty} k(x-t)f(t)dt$	189
TABLE 8. The form $\int_a^b k(x-t)f(t)dt$	192

BIBLIOGRAPHY 195

AUTHOR INDEX 230

SUBJECT INDEX 234