Contents

PROLOGUE		V
Chapter I	Asymptotics—A Behavioural Survey.	1
Chapter II	Derivation of Asymptotic Power Series from Convergent Series.	26
Chapter III	Conversion of Power Series into Integral Representations.	56
Chapter IV	Derivation of Asymptotic Power Series from Integral Representations of the Types	
	$\int_0^\infty e^{-u} u^{\sigma} A(u/x) du, \int_0^\infty (e^u \mp 1)^{-1} u^{\sigma} A(u/x) du, \text{ etc.}$	100
Chapter V	Derivation of Asymptotic Expansions from Integral Representations of the Forms	
	$\int_{\text{limit}} e^{-F} G du \text{ and } \int_{0}^{\infty} e^{-F} u^{\sigma} G du.$	110
Chapter VI	Derivation of Asymptotic Expansions from Integral Representations of the Form	
	$\int_{\text{s.p.}} e^{-F} G du \text{(Stationary-point methods)}.$	131
Chapter VII	Calculation of Late Terms; L_r, Q_r, C_r , etc. for $r \gg 1$.	140
Chapter VIII	Applications of Preceding Theory on $\int e^{-F} G du$ and $\int e^{-F} u^{\sigma} G du$.	155
Chapter IX	Derivation of Asymptotic Expansions from Integral Representations of the Form	
	$\int\!\!\int_{s.p.} e^{-F(u,v)} G(u,v) du dv.$	209
Chapter X	Derivation of Uniform Asymptotic Expansions from Integral Representations of the Form $\int_{-\infty}^{\infty} G du$	216

CONTENTS xiv

xiv	CONTENTS	
Chapter XI	Derivation of Uniform Asymptotic Expansions from Integral Representations	
	$\int_{u=0}^{\infty} e^{-F(u)} (u-u_0)^{\sigma} G(u) du$	
	and $\int_{\mathrm{s.p.}} e^{-F(u)} (u - u_0)^{\sigma} G(u) du.$	255
Chapter XII	Derivation of Asymptotic Power Series from Homogeneous Differential Equations.	275
Chapter XIII	Derivation of Asymptotic Expansions from Homogeneous Differential Equations (Phase-Integral, Liouville-Green or W.K.B. approach).	285
Chapter XIV	Non-linear Approach to Phase-Integral Theory.	322
Chapter XV	Derivation of Uniform Asymptotic Expansions from Homogeneous Differential Equations.	331
Chapter XVI	Derivation of Asymptotic Expansions from Homogeneous Differential Equations in which the Second Derivative is Relatively Insignificant.	351
Chapter XVII	Derivation of Uniform Asymptotic Expansions from Homogeneous Differential Equations in which the Second Derivative is Significant only over a Short Range.	363
Chapter XVIII	Derivation of Asymptotic Power Series from Inhomogeneous Differential Equations.	371
Chapter XIX	Derivation of Asymptotic Expansions from Inhomogeneous Differential Equations.	382
Chapter XX	Derivation of Uniform Asymptotic Expansions from Inhomogeneous Differential Equations.	396
Chapter XXI	Theory of Terminants.	401
Chapter XXII	Termination of Asymptotic Power Series.	431
Chapter XXII	I Termination of Asymptotic Expansions derived from Integral Representations.	452
Chapter XXIV	Termination of Asymptotic Expansions derived from Homogeneous Differential Equations (Phase-Integral Method).	489

	CONTENTS	xv
Chapter XXV	Termination of Asymptotic Expansions derived from Homogeneous Differential Equations in which the Second Derivative is Relatively Insignificant.	499
Chapter XXVI	Termination of Asymptotic Expansions derived from Inhomogeneous Differential Equations.	507
Author/Subject Index		515