Contents

	Preface	v
	Problems	
1.	ORDINARY DIFFERENTIAL EQUATIONS	3
	Existence, Uniqueness, Differential Equations on R,	
	Inequalities (1.1–1.110)	3
	Linear Differential Equations (1.111-1.142)	15
	Second-Order Linear Equations (1.143-1.194)	19
	Second-Order Nonlinear Equations (1.195-1.218)	26
	Differential Equations in the Plane (1.219-1.281)	28
	Flows, Singular Points, Bifurcations (1.282–1.365)	34
	Stability Theory and Related Topics (1.366-1.434)	42
	Higher-Order Differential Equations (1.435-1.447)	48
	Differential Equations in the Complex Domain (1.448-1.467)	50
	Boundary Value Problems and Periodic Solutions (1.468-1.586)	53
	Singular Perturbations, Asymptotic Theory,	
	Averaging (1.587-1.606)	65
	Equations in Banach Spaces (1.607-1.616)	67
	Functional-Differential Equations (1.617-1.630)	68
	Integral Equations (1.631–1.657)	69

viii	Contents

2.

Applications to Mechanics, Physics, Biology, and	
Geometry (1.658–1.764)	72
PARTIAL DIFFERENTIAL EQUATIONS	85
General Questions and Some Linear Equations (2.1-2.30)	85
Elliptic Equations (2.31–2.143)	88
Schrödinger Operators and Schrödinger Evolution	
Equations (2.144-2.160)	103
Parabolic Equations (2.161–2.232)	106
Hyperbolic Equations (2.233–2.291)	115
Semigroups and Singular Perturbation Problems (2.292-2.329)	123
Miscellaneous Equations and Systems (2.330-2.384)	127
Hints, Answers, References	
ORDINARY DIFFERENTIAL EQUATIONS	139
PARTIAL DIFFERENTIAL EQUATIONS	186
References	225
	225
Index	235