Contents

List of Contributors	ix
List of Participants	xiii
Preface	χv
LECTURES	
Perturbations of Liénard Systems with Symmetries T. T. Bowman	1
An Abstract Existence Theorem across a Point of Resonance Lamberto Cesari	11
The Principle of Exchange of Stability Michael G. Crandall and Paul H. Rabinowitz	27
Almost Periodic Processes and Almost Periodic Solutions of Evolution Equations C. M. Dafermos	43
Semilinear Elliptic Problems with Non-Linearities near the First Eigenvalue D. G. de Figueiredo	59
Weak-Invariance and Rest Points in Control Systems M. L. J. Hautus, Michael Heymann, and Ronald J. Stern	71
High Order Controlled Stability and Controllability H. Hermes	89
On the Behavior of Linear Undamped Elastic Systems Perturbed by Follower Forces E. F. Infante and J. A. Walker	101
Random Operator Equations R. Kannan	113
Some Asymptotic Properties of Solutions of the Navier-Stokes Equations George H. Knightly	139
Local Controllability in Nonlinear Systems H. W. Knobloch	157

New Stability Results for Nonautonomous Systems J. P. LaSalle	175
Branching of Solutions of Two-Parameter Boundary Value Problems for Second Order Differential Equations W. S. Loud	185
Periodic Solutions of Nonlinear Telegraph Equations Jean Mawhin	193
Non-Selfadjoint Semilinear Equations at Simple Resonance in the Alternative Method P. J. McKenna	211
Periodic Solutions of Some Nonlinear Integral Equations Roger D. Nussbaum	221
Unitary Treatment of Various Types of Systems in Stability-Theory V. M. Popov	251
Optimization of Structural Geometry W. Prager and G. I. N. Rozvany	265
On the Cesari Index and the Browder-Petryshin Degree E. H. Rothe	295
Dispersal Manifolds in Partial Differential Games Emilio O. Roxin	313
Conditions for Constrained Pareto Optima on a Banach Space with a Finite Number of Criteria Carl P. Simon	323
Remarks on Existence Theorems for Pareto Optimality M. B. Suryanarayana	335
The Stability of Solutions Bifurcating from Steady or Periodic Solutions H. F. Weinberger	349
Modeling Gonorrhea James A. Yorke and Annett Nold	367
CONTRIBUTED PAPERS	
On the Solutions of Second and Third Order Differential Equations Shoshana Abramovich	383
Fixed Point Theorems for Nonlinear Functional Operators S. R. Bernfeld, V. Lakshmikantham, and Y. M. Reddy	387

CONTENTS	vii
On the Convergence of Solutions of Liénard's Equation with a Forcing Term	391
Yuri Bibikov	
Approximate and Complete Controllability of Nonlinear Systems to a Convex Target Set Ethelbert N. Chukwu and Jan M. Gronski	395
Linear Neutral Functional Differential Equations on a Banach Space Richard Datko	401
Periodic Solutions of Differential Systems of Liénard and Rayleigh Type Richard I. DeVries	405
Existence of an Optimal Control for Stochastic Systems Governed by Ito Equations Robert M. Goor	411
Asymptotic Behavior of Solutions of Nonlinear Functional Differential Equations John R. Graef and Paul W. Spikes	415
Before Bifurcation and Nonlinearity: Solutions of the Linear Problem John Gregory	419
Sums of Ranges of Operators and Applications Chaitan P. Gupta	423
Radiation Reaction in Electrodynamics Deh-phone K. Hsing and R. D. Driver	427
Invariant Sets for Certain Liénard Equations with Delay J. Inciura	431
Oscillation of a Forced Non-Linear Second Order Differential Equation Gary D. Jones and Samuel M. Rankin, III	435
Solutions of Algebraic Matrix Equations Related to Optimal Control Theory John Jones, Jr.	437
Razumikhin Type Theorem for Differential Equations with Infinite Delay Junji Kato	441
Periodic and Nonperiodic Motions of Homogeneous Turbulence Jon Lee	445
Buckling of Cylindrical Shells with Small Curvature	449

viii CONTENTS

Function Space Controllability of Retarded Systems: A Derivation from Abstract Operator Conditions A. Manitius and R. Triggiani	453
Passivity and Eventual Passivity of Electrical Networks T. Matsumoto	459
Inequalities for the Zeros of Bessel Functions Roger C. McCann	465
A Homogeneous, Nonadiabatic Model of Delta Cephei Peter J. Melvin	467
Explosions in Completely Unstable Dynamical Systems Zbigniew Nitechi	473
An Alternative Problem with an Asymptotically Linear Nonlinearity J. D. Schuur	477
Positive Invariance of Closed Sets for Systems of Delay-Differential Equations George Seifert	480
Nonexistence of Almost Periodic Solution Yasutaka Sibuya and Junji Kato	485
A Generalization of the Problem of Lurie to Functional Equations Alfredo Somolinos	489
On the Internal Realization of Nonlinear Behaviors Eduardo D. Sontag	493
Inverse Problems for Dynamical Systems in the Plane Ronald Sverdlove	499
On the Algebraic Criteria for Local Pareto Optima Y. H. Wan	503
Stability of an Infinite System of Differential Equations for the Kinetics of Polymer Degradation Yong J. Yoon	507
Bilinear Integral Equations in Banach Space	513