Contents

PREFACE xi
LIST OF SYMBOLS xii
INTRODUCTION xv

PART I
WEAKLY NONLINEAR PROBLEMS

Chapter 1
PROBLEMS OF LANDESMAN–LAZER TYPE

1. Dirichlet problem for ordinary differential equations of second order 3
2. Periodic problem for ordinary differential equations of second order 21
3. Dirichlet problem for partial differential equations of higher order with nonlinearity dependent on derivatives 33

Chapter 2
WEAKLY NONLINEAR PROBLEMS WITH VANISHING NONLINEARITY

4. Dirichlet problem for higher order partial differential equations 52
5. Neumann problem for second order partial differential equations 64
6. Dirichlet problem for second order partial differential equations 72

Chapter 3
WEAKLY NONLINEAR PROBLEMS WITH OSCILLATING NONLINEARITY

7. Neumann problem for second order partial differential equations 87
8. Periodic problem for second order ordinary differential equation 91
9. Periodic problem for system of second order ordinary differential equations 96
PART II
STRONGLY NONLINEAR PROBLEMS

Chapter 4
SOLVABILITY OF STRONGLY NONLINEAR PROBLEMS

10. Ranges of homogeneous operators 113
11. Fučík's spectrum for strongly nonlinear homogeneous problems 126
12. Perturbation of homogeneous problems - nonresonance case 136
13. Perturbation of homogeneous problems - resonance case 156

Chapter 5
BIFURCATIONS OF STRONGLY NONLINEAR PROBLEMS

14. Global bifurcation results for p-Laplacian 174
15. Local bifurcation of generalized spectrum 193

REFERENCES 203

SUBJECT INDEX 223