Contents

1 Introduction
   1.1 Basic definitions .................................... 7
   1.2 Notations ........................................... 17
   1.3 Basic properties and theorems ...................... 19
   1.4 A survey of results .................................. 22
   1.5 Summary of the thesis ............................... 26
   1.6 List of publications ................................ 35

2 Diameter variability of the product graphs ........ 37
2.1 Diameter variability of the Cartesian product of graphs .......................... 38

2.2 Diameter variability of the strong product of graphs ............................ 54

2.3 Diameter variability of the lexicographic product of graphs ................. 67

3 Diameter vulnerability of the product graphs ................................. 85

3.1 Diameter vulnerability of the product graphs .................................. 86

3.2 Diameter vulnerability of some graph classes .................................. 107

3.3 Wide Diameter of the lexicographic product of graphs ....................... 117

4 Component factors of the product graphs ........................................ 121

4.1 Component factors of the Cartesian product of graphs ....................... 122

4.2 Path factors of Hypercubes and Hamming graphs .......................... 135

5 Domination criticality in the Cartesian product
Contents

of graphs 139

5.1 Domination critical graphs . . . . . . . . . . . . . 140

5.2 Vertex criticality in grids . . . . . . . . . . . . . . . 155

Concluding Remarks 157

List of symbols 159

Bibliography 161

Index 169