Contents

Pı	eface		v
Ι	Ar	c-pancyclicity in multipartite tournaments	1
1	Introduction		
	1.1	Terminology and notation in graphs	3
	1.2	Terminology and notation in digraphs	4
2	The	number of pancyclic arcs in tournaments	7
	2.1	Preliminaries	8
	2.2	t-pancyclic arcs on Hamiltonian cycles	12
	2.3	All tournaments with $h^t(T) = t$ as well as $p^t(T) = t$	16
	2.4	All tournaments with $h^t(T) = t + 1$ as well as $p^t(T) = t + 1$	21
3	Out-arc-pancyclicity of vertices in multipartite tournaments		
	3.1	Preliminaries	45
	3.2	Different approaches for pancyclicity in multipartite tournaments .	48
	3.3	Outpaths of out-arcs of vertices in 2-strong multipartite tournaments ${\bf r}$	53
4	Additive tree spanners of digraphs		
	4.1	Preliminaries	61
	4.2	Concepts of additive tree spanners in digraphs	64
	4.3	Collective additive tree spanners of digraphs	67
II	G	TECS – An application of graph theory in crystallography	75
5	Intr	oduction to GTECS	77
	5.1	The concept of GTECS	78
	5.2	Periodic graphs	80
	5.3	Molecular topology	84

x	Contents

6	Paths and cycles in periodic graphs						
	6.1 Paths						
	6.2	Cycles	91				
7	7 Components and their dimensionality in periodic graphs						
8	Тор	ological symbols	107				
	8.1	Schläfli-Symbol	108				
	8.2	Point- and Vertex-Symbol	109				
		8.2.1 Cycles and rings					
		8.2.2 The two symbols					
	8.3						
Bi	Bibliography						
Li	List of Figures						
Li	List of Notations						
Index							