

# Appendix A

## Notation

Symbol	Definition	Defined
$\alpha(G)$	independence number of a graph $G$	3.1.2
$\chi(G)$	chromatic number of a graph $G$	3.1.1
$\sigma(G)$	domination number of a graph $G$	3.1.3
$\nu(U)$	covering number of a set system $U$	5.1.2
$\nu^*(U)$	exact covering number of a set system $U$	5.1.2
$\omega(G)$	clique number of graph $G$	3.1.2
2P	two pair reduction	3.2.4
A	autonomous reduction	3.2.1
$b(G, u, v)$	minimum $u$ - $v$ bottleneck distance in graph $G$	4.1.1
$b(U, B)$	bin packing number of a set $U$ with bin capacity $B$	5.1.1
$c(G, uv)$	cost of edge $uv$ of graph $G$	4.1
C	autonomous clique reduction	3.2.1
$\hat{C}$	quasi-autonomous clique reduction	3.2.5
CEC	change edge costs reduction	4.2.7
CRT	cut reachability reduction	4.2.2

Symbol	Definition	Defined
$d(G, u, v)$	length of minimum $u$ - $v$ path in graph $G$	4.1.1
$D(G)$	distance graph of graph $G$	4.1.1
DC	dominated column reduction	5.2.2
$\deg(G, v)$	degree of vertex $v$ of graph $G$	3.1
DF	dominant feasible set reduction	5.2.1
DF1	unique column reduction	5.2.1
$\text{dom}(\mathcal{A})$	domain of set of operations $\mathcal{A}$	2.1
DR	dominated row reduction	5.2.3
DS	disconnected system reduction	5.2.4
$E(G)$	edge set of graph $G$	3.1
E	even pair reduction	3.2.4
eCRT	edge cut reachability reduction	4.2.2
$h(G)$	maximum weight of a vertex of graph $G$	3.2.3
LBD	local bottleneck distance reduction	4.2.6
LSC	local Steiner cost reduction	4.2.5
$\text{MST}(G)$	minimum spanning tree of graph $G$	4.1.1
$N(G, v)$	neighbourhood of vertex $v$ in graph $G$	3.1
NSC	nearest special or chord vertices reduction	4.2.3
$\varphi^\xi$	operator of reduction $\xi$	2.1
$R(U, u)$	set of sets containing $u$ in set system $U$	5.1
RD	row difference reduction	5.2.5
RC	reduced costs reduction	5.2.6
RT	reachability reduction	4.2.1
$s(G, u, v)$	minimum $u$ - $v$ special distance in graph $G$	4.1.1
$S(U)$	ground set of set system $U$	5.1
S	subset reduction	3.2.2
$\bar{S}$	superset reduction	3.2.2
SD	smaller special distances reduction	4.2.4

Symbol	Definition	Defined
SF	subset feasible set reduction	5.2.1
$t(G)$	weight of minimum Steiner tree for $G$	4.1
UC	under-constrained deletion	3.2.3
$\bar{U}C$	over-constrained deletion	3.2.3
$V(G)$	vertex set of graph $G$	3.1
$vCRT$	vertex cut reachability reduction	4.2.2
$w(G, v)$	weight of vertex $v$ of graph $G$	3.1
$wdeg(G, v)$	weighted degree of vertex $v$ in graph $G$	3.1
$x^\xi$	vertex resulting from reduction $\xi$	3.2
$x^\xi$	vertex subject to reduction $\xi$	4.2
$X^\xi$	set of vertices subject to reduction $\xi$	3.2
$x^\xi y^\xi$	edge subject to reduction $\xi$	4.2
$\mathcal{X}(\mathcal{A}, \mathcal{I})$	set of all reductions from $\mathcal{A}$ on $\mathcal{I}$	6.1
$\downarrow$	“are joinable” relation	2.1
$\rightarrow$	“reduces to” relation	2.1
$\xrightarrow{*}$	reflexive, transitive closure of $\rightarrow$	2.1
$G X$	subgraph of $G$ induced by a vertex set $X$	3.1

