

List of Symbols

(d_1, d_2, \dots, d_n)	The degree sequence of a graph, page 11
$(G_1)_y$	The G_1 -fiber or G_1 -layer at the vertex y of G_2 , page 28
$(G_2)_x$	The G_2 -fiber or G_2 -layer at the vertex x of G_1 , page 28
$(S(v_1), S(v_2), \dots, S(v_n))$	The score vector of a tournament with vertex set $\{v_1, v_2, \dots, v_n\}$, page 44
$[S, \bar{S}]$	An edge cut of graph G , page 50
$\alpha(G)$	The stability or the independence number of graph G , page 98
$\beta(G)$	The covering number of graph G , page 98
$\chi(G)$	The chromatic number of graph G , page 144
$\chi(G; \lambda)$	The characteristic polynomial of graph G , page 242
χ'	The edge-chromatic number of a graph, page 159
$\chi'(G)$	The edge-chromatic number of graph G , page 159
$\Delta(G)$	The maximum degree of graph G , page 10
$\delta(G)$	The minimum degree of graph G , page 10
γ -set	A minimum dominating set of a graph, page 221
$\Gamma(G)$	The upper domination number of graph G , page 228
$\gamma(G)$	The domination number of graph G , page 221
$\kappa(G)$	The vertex connectivity of graph G , page 53
$\lambda(G)$	The edge connectivity of graph G , page 53
$\lambda_c(G)$	The cyclical edge connectivity of graph G , page 61
$\mathcal{E}(G)$	The energy of graph G , page 271
\mathcal{F}	The set of faces of the plane graph G , page 178
$\mu(G)$	The Mycielskian of graph G , page 156
$\omega(G)$	The number of components of graph G , page 14
$\phi_1 \circ \phi_2$	The composition of the mappings ϕ_1 and ϕ_2 (ϕ_2 followed ϕ_1), page 18
$\psi(G)$	The pseudoachromatic number of graph G , page 151
$\left(\begin{smallmatrix} \lambda_1 & \lambda_2 & \dots & \lambda_s \\ m_1 & m_2 & \dots & m_s \end{smallmatrix} \right)$	The spectrum of a graph in which the λ_i is repeated m_i times, $1 \leq i \leq s$, page 242

$\rho(G)$	The 2-packing number of graph G , page 230
$f(G)$	The number of faces of a plane graph G , page 180
\cong	Is isomorphic to, page 5
$\tau(G)$	The number of spanning trees of graph G , page 81
$A(D)$	The set of arcs of digraph D , page 37
A^T	The transpose of the matrix A , page 242
$A_L(G)$	The adjacency matrix of the line graph of graph G , page 246
$b(f)$	The boundary of a face f in a plane graph, page 178
$B(G)$	The bipartite graph of graph G , page 214
$b(v)$	The number of blocks of G containing the vertex v , page 70
c	The capacity function of a network, page 61
$c(a)$	The capacity of arc a , page 61
$c(B)$	The number of cut vertices of G belonging to the block B , page 70
$c(H)$	The number of cycle components of H , page 250
C_k	The cycle of length k , page 13
D	A directed graph, or digraph, page 37
$d(f)$	The degree of the face f in a plane graph, page 178
$d(u, v)$	The length of a shortest u - v path in a graph, page 14
$d(v)$	The degree or valency of the vertex v in a graph, page 10
$d_D^+(v)$	The outdegree of v in digraph D , page 38
$d_D^-(v)$	The indegree of v in digraph D , page 38
$d_G(v)$	The degree or valency of the vertex v in G , page 10
D_n	The dihedral group of order $2n$, page 35
$d_D(v)$	The degree of v in D , page 38
$E(G)$	The edge set of graph G , page 2
$e(H)$	The number of even components in H , page 250
$e(v)$	The eccentricity of vertex v , page 77
f	The flow function in a network, page 62
$f(G; \lambda)$	The chromatic polynomial of graph G , page 170
$f : G \rightarrow H$	A homomorphism f of graphs from G to H , page 153
$f^+(S)$	$f([S, \bar{S}])$, where $S \subseteq V(D)$, page 62
$f^-(S)$	$f([\bar{S}, S])$, where $S \subseteq V(D)$, page 62
f_{uv}	$f((u, v))$, the flow on the arc (u, v) , page 62
$G(D)$	The underlying graph of digraph D , page 37
$G(X, Y)$	A bipartite graph G with bipartition (X, Y) , page 6
$G * H$	A general graph product of the two graphs G and H , page 26
$G + uv$	The supergraph of G obtained by adding the new edge uv , page 8
$G - e$	The subgraph of G obtained by deleting the edge e , page 9

$G - E'$	The subgraph of G obtained by the deletion of the edges in $E' \subset E(G)$, page 8
$G - S$	The subgraph of G obtained by the deletion of the vertices in $S \subset V(G)$, page 8
$G - v$	The subgraph of G obtained by deleting the vertex v , page 8
$G[E']$	The subgraph of G induced by the subset E' of $E(G)$, page 8
$G[S]$	The subgraph of G induced by the subset S of $V(G)$, page 8
$G \circ e$	The graph obtained from G by contracting the edge e , page 81
G^*	The canonical embedding of the plane graph G , page 186
G^c	The complement of a simple graph G , page 7
G^k	The k th power of graph G , page 30
$G_1 + G_2$	The sum of the two graphs G_1 and G_2 , page 25
$G_1 \square G_2$	The Cartesian product of the graph G_1 with the graph G_2 , page 27
$G_1 \boxtimes G_2$	The normal or strong product of the graph G_1 with the graph G_2 , page 28
$G_1 \cap G_2$	The intersection of the two graphs G_1 and G_2 , page 25
$G_1 \cup G_2$	The union of the two graphs G_1 and G_2 , page 24
$G_1 \times G_2$	The Kronecker or direct or tensor product of the graph G_1 with the graph G_2 , page 27
$G_1 \vee G_2$	The join of the two graphs G_1 and G_2 , page 25
$G_1[G_2]$	The lexicographic or composition or wreath product of the graph G_1 with the graph G_2 , page 27
$i(G)$	The independence domination number of graph G , page 227
I_D	The incidence relation of digraph D , page 37
I_G	The incidence relation of graph G , page 2
$I_G(e)$	The incidence relation of the edge e in graph G , page 2
$IR(G)$	The upper irredundance number of graph G , page 228
$ir(G)$	The irredundance number of graph G , page 228
$K(G)$	The clique graph of graph G , page 215
K_n	The complete graph on n vertices, page 6
$K_{1,q}$	The star of size q , page 6
$K_{p,q}$	The complete bipartite graph with part sizes p and q , page 6
$L(G)$	The line graph or the edge graph of graph G , page 20
$m(G)$	The size of G = the number of edges in graph G , page 3
N	A network, page 61

$n(G)$	The order of G = the number of vertices in graph G , page 3
$N_G(v)$	The open neighborhood of the vertex v in graph G , page 3
$N_G[v]$	The closed neighborhood of the vertex v in graph G , page 3
$NEPS$	The Non-complete Extended P-Sum (of graphs), page 251
$O(G)$	The number of odd components of graph G , page 107
$O^+(v)$	The number of outneighbors of v in a digraph, page 46
P	The Petersen graph, page 5
P^{-1}	The inverse of the path P , page 13
P_k	The path of length k , page 13
$r(G)$	The radius of graph G , page 77
s	The source of a network, page 61
$s(G)$	The number of cycle decompositions of graph G , page 121
$S(v)$	The score of the vertex v in a tournament, page 44
S_n	The symmetric group of degree n , page 19
$Sp(G)$	The spectrum of graph G , page 241
t	The sink of a network, page 61
$V(D)$	The set of vertices of digraph D , page 37
$V(G)$	The vertex set of graph G , page 2
X_n	$\text{Cay}(\mathbb{Z}_n; U_n)$, the unitary Cayley graph, page 254
$a(G)$	The achromatic number of graph G , page 151
$\text{Aut}(G)$	The group of automorphisms of the graph G , page 18
$b(G)$	The b-chromatic number of graph G , page 152
$\text{cap } K$	The sum of capacities of the arcs in K , page 63
$\text{cl}(G)$	The closure of graph G , page 127
$\text{diam}(G)$	The diameter of graph G , page 35
$\text{ext } J$	The exterior of a closed Jordan curve, page 176
$\text{int } J$	The interior of a closed Jordan curve, page 176
$\text{val } f$	The value of the flow f in a network, page 63

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