
Index

- 2-Parter edge, 91
- 2-downer edge, 91
- 2-tree (linear), 222

- ABD, 115
- algebraic branch duplication, 115
 - (general), 119
- algebraic multiplicity of an eigenvalue, 1
- arm of a generalized star, 167
- assignment
 - (realizable), 149
 - of a tree, 148
 - of eigenvalues to subtrees, 147

- binary tree, 7
- bipartite graph, 6
- branch, 8
 - (downer), 25
 - of a general (undirected) graph, 49
- branch duplication
 - (algebraic), 115
 - (combinatorial), 112
 - (general combinatorial), 119
- bridge formula, 8
- bridge of a graph, 49

- catalog
 - (ordered), 11
 - (unordered), 11
 - (upward), 182
- caterpillar, 107
- CBD, 112
- central vertex of a generalized star, 167
- characteristic polynomial, 1
 - of a tree, 8
- clique, 222

- combinatorial branch duplication, 112
 - (general), 119
- combinatorially orthogonal, 84
- combinatorially symmetric matrix, 232
- complete
 - binary tree, 7
 - bipartite graph, 6
 - graph, 6
- complete upward multiplicity list, 202
- component (downer), 49
- components of a k -linear tree, 201
- conjecture (degree), 209
- conjugate partition, 9
- connected graph, 5
- cut-edge of a graph, 49
- cycle, 5, 213

- deficiency (rank), 232
- degree
 - of a vertex, 5
 - sequence of a tree, 6
- degree conjecture, 209
- depth 1 linear tree, 208
- diminimal tree, 112
- diagonal unitary similarity, 147
- diagonally symmetrizable matrix, 240
- diameter
 - of a graph, 110
 - of a tree, 7, 110
- diameter d seed, 113
- disparity for a given diameter of a tree, 110, 128
- DM -graph, 226
- dominating vertex, 228
- double generalized star, 186
- double path, 186, 196

288

double star, 186
 doubly upward eigenvalue, 187
 downer
 branch, 25
 component, 49
 edge, 91
 index, 26
 neighbor, 25
 regions, 80
 vertex, 16, 25, 69
 downer branch mechanism, 26
 dual multiplicity (graphs with), 226
 duplicates vertices, 227
 duplication (vertex), 227
 edge
 (2-Parter), 91
 (2-downer), 91
 (downer), 91
 (neutral), 91
 (Parter), 91
 edge subdivision, 6
 edges of a graph, 5
 eigenvalue, 1
 (algebraic multiplicity of an), 1
 (doubly upward), 187
 (geometric multiplicity of an), 1
 (Parter), 16
 (upward), 181
 eigenvalues
 tridiagonal irreducible Hermitian matrix,
 10, 12, 45, 146
 eigenvector, 1
 exceptional families of graphs, 222, 225
 family of a seed, 114
 FD, 80
 forest, 7
 fragmenting Parter set, 76
 fragmenting vertex, 57
 full binary tree, 7
 fundamental decomposition, 80
g-downer vertex, 233
g-neutral vertex, 233
g-Parter set, 233
g-Parter vertex, 233
g-star, 167
 Gale-Ryser Theorem, 174
 general branch duplication
 (algebraic), 119
 general inverse eigenvalue problem, 161

Index

generalized star, 167
 (arm of *a*), 167
 (central vertex of *a*), 167
 (length of an arm of *a*), 167
 generalized vine, 158
 geometric multiplicity of an eigenvalue, 1
 geometrically Parter set, 233
 GIEP, 161
 global downer neighbor, 30
 graph, 5
 (a path in *a*), 5
 (a simple, undirected), 5
 (bipartite), 6
 (bridge of *a*), 49
 (complete bipartite), 6
 (complete), 6
 (connected), 5
 (cut-edge of *a*), 49
 (diameter of *a*), 110
 (edges of *a*), 5
 (induced subgraph of *a*), 5
 (maximum multiplicity of *a*), 51
 (minimum rank of *a*), 51
 (skeleton of *a*), 227, 228
 (subgraph of *a*), 5
 (supergraph of *a*), 5
 (unicyclic connected), 214
 (vertices of *a*), 5
 homeomorph of a graph, 223
 of an Hermitian matrix, 7
 of two parallel paths, 225
 graphs
 (exceptional families of), 222, 225
 skeletally equivalent, 228
 with dual multiplicity, 226
 HDV, 7
 Hermitian matrix, 2
 (algebraic multiplicity of an eigenvalue of
 an), 2, 45, 51
 (eigenvalues of an), 2
 (geometric multiplicity of an eigenvalue of
 an), 2, 45, 51
 (graph of an), 7
 high-degree vertex, 7
 homeomorph to a graph (graph), 223
 IEP, 161
 IFT, 146, 152
 implicit entries, 154
 manual entries, 154
 implicit entries (IFT), 154

- index
 - (downer), 26
 - (nonzero), 82
 - (null), 82
- interlacing inequalities, 2
- inverse eigenvalue problem, 161
- irreducible matrix, 7
- k -component at a vertex, 118
- k -linear tree, 200
 - (components of a), 201
- k -tree, 222
- length of an arm of a generalized star, 167
- linear 2-tree, 222
- linear superposition principle, 202
- linear tree, 7, 15, 200
 - (depth 1), 208
- local downer neighbor, 30
- LSP, 202
- M-matrix, 4
- majorization of partitions, 9
- manual entries (IFT), 154
- matrix
 - (combinatorially symmetric), 232
 - (diagonally symmetrizable), 240
 - (Hermitian), 2
 - (irreducible), 7
 - (M-), 4
 - (orthogonal), 2
 - (primitive), 4, 44
 - (real symmetric), 2
 - (reducible), 7
 - (unitary), 2
- maximal connected subgraph, 203
- maximum multiplicity
 - of a graph, 51
 - of a tree, 58
- maximum $p - q$, 53
- minimum number of distinct eigenvalues, 110
- minimum path cover, 52
- minimum rank, 51
 - of a graph, 51
- multiplicity (upward), 181
- multiplicity list
 - (ordered), 10
 - (realizable), 149
 - (unordered), 10
 - (upward), 181
- multiplicity lists
 - (set of ordered), 11
 - (set of unordered), 11
 - (set of upward), 182
- multiply Parter vertex, 26
- neighbor
 - (downer), 25
 - (global downer), 30
 - (local downer), 30
- neighbors formula, 8
- neutral
 - edge, 91
 - regions, 80
 - vertex, 16, 69
- NIM tree, 101
- nonlinear 10-vertex tree, 61
- nonzero
 - vertex, 82
 - index, 82
- null
 - index, 82
 - vertex, 82
- ordered
 - catalog, 11
 - multiplicity list, 10
- orthogonal (combinatorially), 84
- orthogonal matrix, 2
- overloaded tree, 148
- Parter
 - edge, 91
 - eigenvalue, 16
 - set, 74
 - vertex, 16, 69
- Parter set (geometrically), 233
- partial k -tree, 222
- partition, 8
 - (conjugate), 9
 - (parts of a), 8
 - (rectilinear dot diagram of a), 9
 - majorized by other partition, 9
- parts of a partition, 8
- path, 5
 - (double), 186, 196
 - (pendent), 46
 - (simple), 5
 - (v -fragmenting), 63
- tree, 52
- path cover
 - (minimum), 52
 - of a tree, 51
- path cover number, 14, 52, 58

- path tree, 52
 paths (graph of two parallel), 225
 pendent
 - component of a general (undirected) graph, 49
 - path, 46
 - vertex, 6
 perturbation of a diagonal entry, 69
 primitive matrix, 4, 44
 quasi-neutral vertex, 80
 rank
 - (minimum), 51
 - deficiency, 232
 real symmetric matrix, 2
 - (algebraic multiplicity of an eigenvalue of a), 2, 45
 - (eigenvalues of a), 2
 - (geometric multiplicity of an eigenvalue of a), 2, 45
 realizable
 - assignment, 149
 - multiplicity list, 149
 rectilinear dot diagram of a partition, 9
 reducible matrix, 7
 refinement of a sequence of integers, 155
 regions
 - (downer), 80
 - (neutral), 80
 residual path maximizing set, 53
 RPM set, 53
 seed
 - (family of a), 114
 - of diameter d , 113
 segregated tree, 65
 set (fragmenting Parter), 76
 set (Parter), 74
 set of complete upward multiplicity lists, 202
 set of ordered multiplicity lists, 11
 set of unordered multiplicity lists, 11
 set of upward multiplicity lists, 182
 simple path, 5
 simple star, 167
 singly Parter vertex, 26
 skeletally equivalent (graphs), 228
 skeleton of a graph, 227, 228
 spanning tree, 6
 spectral radius, 4
 star, 7
 - (central vertex of a), 7
 - (double generalized), 186
 - (double), 186
 - (generalized), 167
 - (simple), 167
 status of a vertex, 28
 subdivision (edge), 6
 subgraph, 5
 - (induced), 5
 supergraph, 5
 superposition principle, 192
 TPE, 214
 tree, 6
 - (assignment of a), 148
 - (binary), 7
 - (complete binary), 7
 - (degree sequence of a), 6
 - (diminimal), 112
 - (diameter of a), 7, 110
 - (disparity for a given diameter of a), 110, 128
 - (full binary), 7
 - (k -linear), 200
 - (linear), 7, 15, 200
 - (maximum multiplicity of a), 58
 - (NIM), 101
 - (overloaded), 148
 - (path cover of a), 51
 - (path), 52
 - (segregated), 65
 - (spanning), 6
 - (unfolding of a), 113
 caterpillar, 107
 k -tree, 222
 partial k -tree, 222
 vine, 156
 tree-like vertex, 50
 tree + an edge, 214
 tridiagonal irreducible Hermitian matrix
 - (eigenvalues of a), 10, 12, 45, 146
 unfolding of a tree, 113
 unicyclic connected graph, 214
 unitary matrix, 2
 unordered
 - catalog, 11
 - multiplicity list, 10
 upward
 - catalog, 182
 - eigenvalue, 181

- multiplicity, 181
 - multiplicity list, 181
- upward multiplicity list
 - (complete), 202
- v -fragmenting path, 63
- valid pair, 191
- vertex
 - (degree of a), 5
 - (dominating), 228
 - (downer), 16, 25, 69
 - (fragmenting), 57
 - (g -downer), 233
 - (g -neutral), 233
 - (g -Parter), 233
 - (high-degree), 7
 - (k -component at a), 118
 - (multiply Parter), 26
 - (neutral), 16, 69
 - (nonzero), 82
 - (null), 82
 - (Parter), 16, 69
 - (pendent), 6
 - (quasi-neutral), 80
 - (singly Parter), 26
 - (status of a), 28
 - (strong Parter), 18
 - (tree-like), 50
 - duplication, 227
- vertices (duplicates), 227
- vertices of a graph, 5
- vine
 - (generalized), 158
 - (tree), 156
- weak majorization of partitions, 9