Index

A × B, 4
B^n, 20
B(G), 13
BC(n), 88
C(k, n), 14
D(u, v), 25
E(S, T), 13
G.E, 4
G.V, 4
K(n), 5
MAX, 3
MIN, 3
N, 3
N(r), 66
P(n), 5
P.S, 115
Q • R, 74
R(n), 5
R', 118
S, 3
T, 15
W, 14
[g], 33
Ξ, 3
∀, 3
ζ, 6
~α, 32
av(f), 67
b(R(n), U, i mod s), 40
b(G, R(n), α), 39
c(f), 67
cap.u, 113
d(u), 5
d_G, 5
dk, 6
from.n, 113
k(u, v), 5
k_G, 5
md, 17
mess.n, 113
nc, 16
p(f), 66
q(f), 66
i_0(g, h, I), 25
t_1(u, v), 26
to.n, 113
{}, 25
admissible.n.u, 115
α-automorphism, 33
α-vertex-transitive, 33
automorphism, 31
automorphism of a graph, 30
average cost of mapping, 67
average distance, 6
average message density, 17
average network distance, 15
binary tree, 88
INDEX

bisection width, 13, 14
boolean n-cube, 14, 79
braid graph
  connected, 28
diameter, 24, 27
distance, 24
  routing algorithm, 24, 29
braiding, 19, 22
cartesian product, 23, 26
cartesian product of graphs, 20
complete graph, 5, 20, 24
computation graph, 65, 79
configuration, 115
  non-empty, 115
connected braid graph, 28
connected graph, 4
cost of a mapping, 65, 67
cube-connected cycles, 43, 48
deadlock-free routing algorithm, 115
  k-ary n-cube, 126
boolean n-cube, 125
cartesian product graph, 123
  complete graph, 120
  ring graph, 121
degree
  of a graph, 5
  of a vertex, 5
degree-regular, 5, 19, 79
diameter, 5, 41
difference set, 25
difference-set-complete path, 45, 46, 52
directed graph, 113
distance, 5
distance density function, 6
distance-regular, 6, 31
distributed algorithm, 1
distributed computation, 11
degree
  of a graph, 5
degree-regular, 5, 19, 79
diameter, 5, 41
difference set, 25
difference-set-complete path, 45, 46, 52
directed graph, 113
distance, 5
distance density function, 6
distance-regular, 6, 31
distributed algorithm, 1
distributed computation, 11
degree
  of a graph, 5
degree-regular, 5, 19, 79
diameter, 5, 41
difference set, 25
difference-set-complete path, 45, 46, 52
directed graph, 113
distance, 5
distance density function, 6
distance-regular, 6, 31
distributed algorithm, 1
distributed computation, 11
edge, 4
equivalence relation, 32

graph, 4
  connected, 4
  vertex-transitive, 31
graph embedding, 66, 69
graph-connected ring, 39–59
  bisection width, 40, 41
diameter, 42
latency, 44–59
  routing algorithm, 44–46
Hamiltonian cycle, 7, 30, 39, 82, 99, 101, 107
height-homogeneous mapping, 79, 90, 95
homogeneous mapping, 66, 65–77
implementation graph, 6, 65
k-ary n-cube, 13, 14,
  average distance 15
  bisection width, 14
  latency, 15
  network capacity, 17
latency, 12, 14, 44
linear array graph, 5
mapping
  on a torus-connected graph, 103–110
mapping a binary tree
  on a boolean n-cube, 88, 95
  on a Snepetree, 81
mapping a linear array
  on a torus-connected graph, 107
  on a Snepetree, 81
mapping method, 69–77, 103
mapping strategy, 12
network capacity, 16
network latency, 15
normal product, 74
NP-complete problems, 13, 30
INDEX

path, 4
processor network, 1, 113
criteria, 18

quantification, 3
existential, 3
universal, 3

regularity, 2, 11, 12, 30, 79
ring graph, 5, 14, 20, 24, 39
routing algorithm, 114
acyclic, 115
deadlock-free, 115
deterministic, 115, 118
routing unit, 12

self-loops, 22, 113, 115
set formation, 3
set of all functions from A to B, 20
Sneptree, 79, 80
cyclic, 82
starred polygon, 7, 7, 34, 39
static mapping, 96
store-and-forward routing, 14

throughput, 12, 16
torus, 14
torus-connected graph, 39, 59–64, 61, 103
diameter, 62
latency, 61
throughput, 61
travelling length, 25
traversing length, 26

undirected graph, 79
uniform emulation, 67, 69

vertex, 4
vertex-transitive, 30, 31
vertex-transitivity, 19
virtual processor network, 118
VLSI technology, 9–11