NOTE

ON A SPANNING k -TREE IN WHICH SPECIFIED
VERTICES HAVE DEGREE LESS THAN k

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Abstract

A k -tree is a tree with maximum degree at most k . In this paper, we give a degree sum condition for a graph to have a spanning k -tree in which specified vertices have degree less than k . We denote by $\sigma_k(G)$ the minimum value of the degree sum of k independent vertices in a graph G . Let $k \geq 3$ and $s \geq 0$ be integers, and suppose G is a connected graph and $\sigma_k(G) \geq |V(G)| + s - 1$. Then for any s specified vertices, G contains a spanning k -tree in which every specified vertex has degree less than k . The degree condition is sharp.

Keywords: spanning tree, degree bounded tree, degree sum condition.

2010 Mathematics Subject Classification: 05C05, 05C35.

REFERENCES

- [1] M.N. Ellingham, Y. Nam and H.-J. Voss, *Connected (g, f) -factors*, J. Graph Theory **39** (2002) 62–75.
doi:10.1002/jgt.10019
- [2] H. Enomoto and K. Ozeki, *The independence number condition for the existence of a spanning f -tree*, J. Graph Theory **65** (2010) 173–184.
doi:10.1002/jgt.20471
- [3] H. Matsuda and H. Matsumura, *On a k -tree containing specified leaves in a graph*, Graphs Combin. **22** (2006) 371–381.
doi:10.1007/s00373-006-0660-5
- [4] H. Matsuda and H. Matsumura, *Degree conditions and degree bounded trees*, Discrete Math. **309** (2009) 3653–3658.
doi:10.1016/j.disc.2007.12.099

- [5] V. Neumann-Lara and E. Rivera-Campo, *Spanning trees with bounded degrees*, *Combinatorica* **11** (1991) 55–61.
doi:10.1007/BF01375473
- [6] O. Ore, *Note on Hamilton circuits*, *Amer. Math. Monthly* **67** (1960) 55.
- [7] O. Ore, *Hamilton connected graphs*, *J. Math. Pures Appl.* **42** (1963) 21–27.
doi:10.2307/2308928
- [8] S. Win, *Existenz von gerüsten mit vorgeschriebenem maximalgrad in graphen*, *Abh. Math. Seminar Univ. Hamburg* **43** (1975) 263–267.
doi:10.1007/BF02995957
- [9] S. Win, *On a connection between the existence of k -trees and the toughness of a graph*, *Graphs Combin.* **5** (1989) 201–205.
doi:10.1007/BF01788671

Received 16 October 2013

Revised 31 January 2014

Accepted 31 January 2014